AILWAY TRACK and August 1953 STRUCTURES

asting on Inion Pacific

Floats to Site

Protection monding Tracks

ifications for Track Foremen

mts -- Page 727

IMPROVED HIPOWERS



SOUTHERN PACIFIC PHOTO

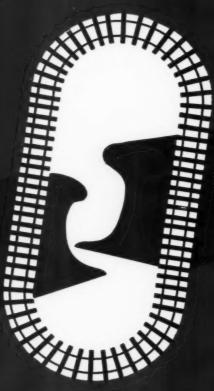
stresses.

Whether track be straightaway or

tangent, the constant stresses and strains of fast passenger trains and heavy freights tend to loosen bolt tensions. No road is completely free from the danger of loosened bolts. The best laid track always includes powerful spring washers. They equalize bolt tensions, insure resilient joints and protect rail ends by absorbing the terrific shocks and

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U.S.A. A COMPLETE LINE OF RAILWAY SPRING WASHERS

Let Reliance HY-CROME spring



washers help you maintain safe rail joints

Safety is a prime factor in the operation of a railroad. This is a commodity that all railroads must sell to their prospective customers.

Tight rail joints contribute to the safety of every railroad's operation. Reliance Hy-Crome Spring Washers manufactured specifically for rail joint bolt applications compensate for looseness created by wear, vibration and bolt elongation in the rail joint. By maintaining constant reactive tension, they keep bolted parts tighter longer.

Investigate this low cost fastening device that will promote a safer, smoother riding track. Write for Engineering Folder R53 which covers the specification and sizes of the Reliance Hy-Crome line of Spring Washers.



"Edgemark of Quality"

RELIANCE DIVISION



NG COMPANY





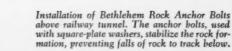
Special Steels Spring Lock Hoz-Fas-Ner

San Francisco

Montrea

Here's the Way to Prevent Rock Slides







You know from experience the havoc and monetary loss which can be caused by rock slides along rights-of-way. But today many dangerous locations can be made free from such troubles by using Bethlehem Rock Anchor Bolts to stabilize the rock formation.

Bethlehem Rock Anchor Bolts anchor layers of rock or individual boulders to bedrock, preventing them from sliding or rolling. They are ideal for use in cuts with high banks, or on steep hillsides, and are highly effective where the formations which they anchor in turn support adjacent or overlying strata.

Bethlehem Rock Anchor Bolts are 29/32 in. in diameter, and come in lengths of from 2 ft to 10 ft. One end of the bolt has 5 in. of 1-in. rolled threads. The opposite end has a 6-in. slot, made by an exclusive forging process which forms the

equivalent of two half-rounds. The slot accommodates a wedge, which is forced deep into the slot when the back of the hole is reached.

The bolts are furnished with an American Standard square nut. They can be installed horizontally or at an angle, and can be used in combination with rock anchor ties, plate washers, and angle washers.

Bethlehem Rock Anchor Bolts are worth looking into. Why not try them out on one of your most dangerous locations? We'll be glad to work out the details with you, whenever you say.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem produce sold by Bethlehem Pacific Coast S Corporation. Export Distributor: Bethlehem Steel Export Corporation



ICHOR BO

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessious. and Canada, one year \$2.00 (special rate to railroad employees only, one year \$1.00). Single copies 50 cents. Entered as second-class matter January 20. 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 49, No. 8.



with

off-track

off-track

off-track

work

Complete Mobilition traffic. Here's why:

Complete Mobilition traffic with traffic making sharp or grad around easily in craft Coutstanding Cycles.

Normal train operations, even on heavily congested lines, need not be delayed by track maintenance equipment. Clearing away land and rock slides, cleaning drainage ditches, restoring embankments, widening and re-aligning right-of-ways... all these and many other jobs can be speedily and efficiently handled by a crawler-mounted Bucyrus-Erie dragline without interference to or from traffic. Here's why:

Complete Mobility — You're working off the tracks, not interfering with traffic flow. Positive steering control permits making sharp or gradual turns. You can climb stiff grades, get around easily in cramped working quarters.

Outstanding Cycle Speeds — Exceptional synchronization of speeds and power results in well balanced work cycle, speedy job completion. Each swift, powerful pass is followed through with high-speed swing and quick, accurate dump.

Easy Operation — Power, speed and flexibility are put into the control levers. Operator can "step on it" because he always has full feel of his machine through direct-connected mechanical controls.

Long-Range Booms — Your operator can dig and dump at varying distances from the tracks. Butt splices make it easy to insert or exchange extra boom sections to fit boom lengths to individual job requirements.

Bucyrus-Erie draglines are easily converted in the field to shovel, crane, clamshell or dragshovel front end. Why not lay plans now for a Bucyrus-Erie on your division? Seven models to choose from — capacity 3/8- to 4-cu. yds.

65E53



save time and money DRILL TIES BEFORE SPIKING with the new NORDBERG



Advantages:

- Field drilling costs can be cut about 75%
- Drills two holes at once, in less than 3 seconds per hole
- Operated entirely by one man
- Drills holes for rail holding or plate fastening spikes
- Always drills holes at right angles to tie
- Spikes have greater holding power . . . tie life is considerably extended

THE new Nordberg Tie Drill is the maintenance machine you need for cutting tie drilling costs... and for increasing the useful life of your ties.

This accurate, versatile machine is the fastest tie drill on the market. It is operated entirely by one man, who can spot and drill 48 holes in the 24 ties of one rail length in just 2½ minutes . . . which is less than 3 seconds per drilled hole.

Can you afford to overlook savings like this? For further details about the Nordberg Tie Drill, write for Bulletin 199... and be sure to see this outstanding machine in the big new Nordberg exhibit at the Chicago Coliseum, September 14-17.

*Copyright, Nordberg Mlg. Co

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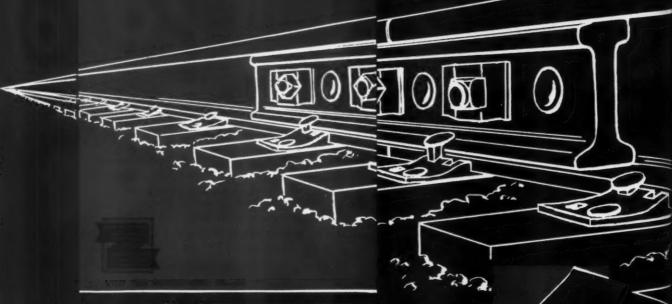
"Mechanical Muscles"
TO DO A BETTER,
FASTER MAINTENANCE
JOB AT LOWER COST . . .

ADZING MACHINE - CRIBEX® - BALLASTEX® - SCREENEX® - SPIKE PULLER - TIE DRILL GANDY—TIE PULLER AND INSERTER - POWER JACK - POWER WRENCH - RAIL DRILL RAIL GRINDERS - TRACK SHIFTER - DSL YARD CLEANER - SPIKE HAMMER
DUN-RITE GAGING MACHINE

NORDBERG MFG. CO., Milwaukee. Wis.



MAN-SIZE JOB



Verona Fixed tension TRIFLEX SPRING

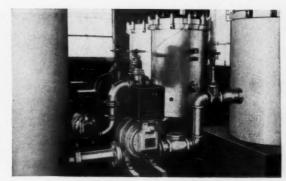
- The highest reactive value in the entire field of spring washers.
- Provides the means for establishing equal tension in each bolt to prevent track buckling and pull-aparts.

The world's Finest Spring Washer

Woodings-Verona



Bowser meter checking lube oil receipts.



Typical Bowser installation measuring, filtering and dispensing diesel fuel oil.



One-package SERV-A-TRAIN diesel or lube oil unit.



High-speed fueling . . . up to 350 g.p.m. from each hose.



FIRST CHOICE...

. . . for oil-handling systems on American railroads

Regardless of what your fueling or lube oil handling problem might be, Bowser can help you solve it. Bowser systems are available in a variety of types and capacities: large systems for terminal multi-fueling, smaller ones for single locomotives, switchers, section work cars or scooters . . . all these are in service every day on most of America's Railroads.

As the pioneer and foremost builder of railroad liquidhandling equipment, Bowser can furnish complete engineering service and can supply all the necessary equipment for proper installation of complete systems. Bowser will also accept full responsibility in assuring you of complete operating satisfaction.

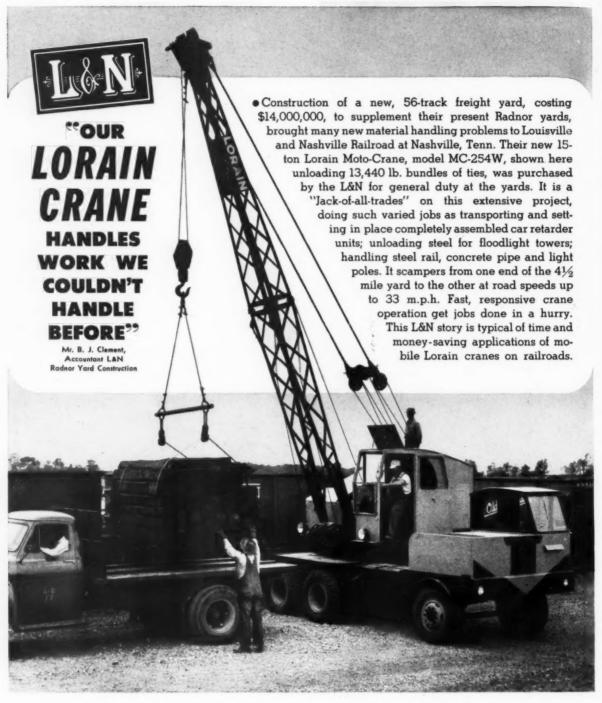


BOWSER INC.

1323 Creighton Ave., Fort Wayne 2, Indiana

CLEVELAND

William C. C. Havillian of



In the photo, a Lorain Moto-Crane, using a special bridle sling, unloads cross ties from car onto trucks. Each bundle contains 64 ties, each tie weighing 210 lbs. A carload of 6 bundles was unloaded to trucks in 12 to 14 minutes. The L&N report that as many as 8 cars were unloaded and bundles spotted in as little as 2 hrs., 35 min.

There are Lorain types—on rubber-tire or crawler mountings -to fit the needs of your road. Ask your Thew-Lorain Distributor for complete story.

THE THEW SHOVEL CO., LORAIN, OHIO





26 types and 5,850 sizes -as near as your telephone

EVERY so often, a machinery maker comes to the Timken Company for help with a very special bearing application. Something, he's pretty sure, we've never encountered before.

Almost always, we're able to give him a pleasant surprise. In over 50 years of helping manufacturers with special bearing problems, all the while improving our designs, we've produced an astonishing variety of tapered roller bearings. So many sizes and shapes that the "new" bearing has usually already been designed and made by the Timken Company. So many that the "new" design problem has usually been already solved with the help of Timken Company engineers.

If the people who buy the machines ever have

occasion to replace a Timken® bearing, they get the same kind of pleasant surprise. Even when a machine's very old, they can almost always get immediate delivery on Timken bearings for replacement.

Be sure that every bearing you use in the machines you buy or build is stamped with the trademark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".





NOT JUST A BALL 🔷 NOT JUST A ROLLER 🥽 THE TIMKEN TAPERED ROLLER 🥽 BEARING TAKES RADIAL 🏟 AND THRUST 🛶 🕳 LOADS OR ANY COMBINATION





Attend the Bridge & Building and Track Supply Assn's Convention. Visit Booths 31 and 32N—Coliseum, Chicago, Sept. 14, 15, 16, 17.

NEWS NOTES...

AUGUST 1953

...a resumé of current events throughout the railroad world Freight car loadings in the third quarter of 1953 are expected to be 8 per cent above those for the same period in 1952, according to estimates of the 13 regional shippers advisory boards. On the basis of these estimates loadings of the 32 principal commodity groups will be 8,033,-202 in the third quarter of this year, compared with 7,441,174 cars actually loaded in the same period of 1952.

In the first five months of this year the Class I railroads had an estimated net income, after interest and rentals, of \$338 million, compared with a net income of \$260 million in the first five months of last year. In May the estimated net income for these roads was \$74 million, compared with \$59 million in the same month last year. These figures are from the Bureau of Railway Economics of the Association of American Railroads.

The railroads have asked the Interstate Commerce Commission to approve an increase of "not less than 45 per cent" in compensation for transporting United States mail. The carriers contend that the cost of handling mail has gone up substantially since the present rates were established in November 1951.

A study to determine the "most appropriate and economical" methods of transporting mail is being conducted by the Post Office Department. Among other things, the department wants to find out how to obtain "a more intelligent utilization of motor trucks and buses," and how to use an air transport industry which has "demonstrated its ability to participate more extensively in the transportation of mail."

Guaranteed sixth-morning delivery at Chicago has been announced for California perishable traffic loaded up to 11:59 p.m. Previously seventh-morning delivery was guaranteed. The faster service is being offered by the Santa Fe, and the Union Pacific—Chicago & North Western.

Grade-crossing protection is carried to unusual lengths in certain rural districts in Germany. Little-used crossings have gates that are permanently lowered. When a motorist wishes to cross the tracks he is directed by a sign to use an adjacent loudspeaker system which connects him with the dispatcher. By remote control the gates are raised for passage or the motorist is advised how long it will be until he will be permitted to cross.

Total net claims paid by U.S. scheduled air carriers for loss or damage to air freight in 1952 amounted to only three-fourths of a cent on every dollar of freight revenue received. The Air Transport Association, in announcing these figures, pointed out that the results are noteworthy because nearly all freight shipments are in the less-than-truck-load or less-than-car-load category and, as such, are more susceptible to loss or damage.

NEWS NOTES (continued)

The Interstate Commerce Commission has determined that 75 miles is the point at which the "inherent advantage" of trucks gives way to the "inherent advantage" of railroads in the transportation of gasoline and light oils from points in Wyoming and Colorado to destinations in those states and nearby areas.

Lengths of butt-welded rail a half mile long were recently transported by the Northern Pacific from a welding plant set up at Big Timber, Mont. to Stampede tunnel, near Seattle, Wash., a distance of 850 miles. The rail was carried in a train of 60 open-end ballast cars.

Perishable traffic is still being diverted from the railroads to highway trucks. A study made by the United States Department of Agriculture shows that the number of carloads of eight selected fresh fruits and vegetables moving to ten of the country's largest markets dropped five per cent between 1948 and 1951.

Tests made with helium-filled balloons placed near the tracks on slender sticks have disproved the theory that "suction" is created by trains going by at high speeds. The tests were made by the Illinois Commerce Commission in connection with a petition seeking to limit the speeds of Chicago & North Western trains over heavily traveled grade crossings in Glencoe, Ill. The petition argued that the "suction" from high-speed streamliners was apt to draw persons standing close to the track right under the trains.

Deliveries of new domestic freight cars in June totaled 6,463, compared with 6,582 in May and 6,411 in June 1952, according to the American Railway Car Institute and the Association of American Railroads. Orders for 1,463 freight cars were placed by the railroads in June. The backlog of cars on order as of July 1 was 52,315.

Approximately \$4 million will be spent on new yard tracks and facilities at Ogden, Utah, for the Ogden Union Railway and Depot Company, Pacific Fruit Express and the Union Pacific. The purpose is to provide capacity for handling the heavy volume of traffic arising from the national defense effort and the "rapidly expanding industrialization of the west." The Union Pacific is also preparing to ask for bids for the construction of extensive new facilities at East Spokane, Wash. This project will involve the construction of about 58,700 ft. of additional trackage, plus facilities for servicing and fueling diesel locomotives.

ALSO WORTH NOTING—The 8,000-mile Southern System is now the largest all-diesel railroad. Its last scheduled steam-drawn train was a local freight which puffed into Chattanooga on June 17 . . . Commissioner J. Monroe Johnson was elected chairman of the Interstate Commerce Commission for the year beginning July 1 . . . During July six officers from the Yugoslav State Railways were in the United States studying the planning, construction and operation of railroad yards.

The A. O. Smith Champion Heavy-Duty A. C. Welder

6000 hours longer life

than any other A.C. welder

Available in 300-, 400-, and 500-Amp. models. PROOF LIFE EXPECTANCY CHART SILICONE INSULATION 120 ORDINARY WELDERS GLASS INSULATION 100 80 A. O. SMITH CHAMPION 40 20 2,000 4,000 6,000 8,000 10,000 12,000 14,000 **Operating Hours**

Temperature Rise Determines Machine Life

According to the Insulation and Aging versus Temperature Curves, as published by the A.I.E.E. . . . the cooler a welding machine operates, the longer its production life.

The A. O. Smith Champion is the only A. C. welder on the market with enough copper and cooling capacity to operate without exceeding a 55° C. temperature rise—as compared to the 90° C. rise allowed by N.E.M.A. for glass-insulated welders.

This means: The Champion will give you top production efficiency almost twice

as long as any other A. C. welder on the market today.

Built for those who want the best in welding, the Champion has a full 75 open circuit volts, high-velocity down-draft ventilation, all-weather case, 12½ KVA power factor correction and stepless current control.

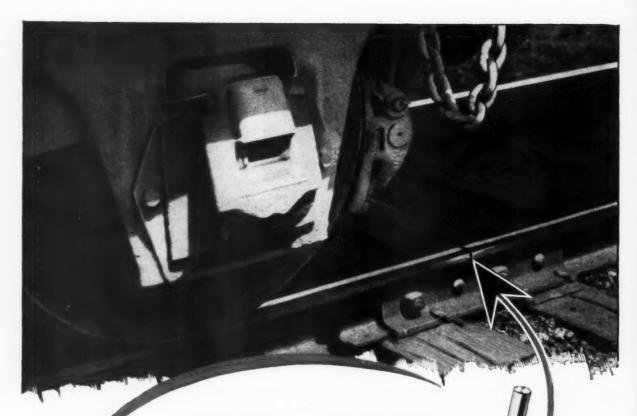
For additional information on welding machines, electrodes and accessories, see your local A. O. Smith distributor or write to A. O. Smith Corporation, Welding Products Division, Milwaukee 1, Wisconsin.



A.O.Smith

WELDING PRODUCTS DIVISION

Dept. RT-853, Milwaukee 1, Wisconsin INTERNATIONAL DIVISION: MILWAUKEE 1 Made by welders...for welders



Battered Rails

Rail-ends rebuilt with OXWELD MW rod last 50 to 100 per cent longer in first position. This specially developed rod provides hardness, abrasion resistance, and high tensile strength... more batter-resistance than the original rail. Ask OXWELD for more information.

OXWELD RAILROAD SERVICE COMPANY

A Division of Union Carbide and Carbon Corporation

Carbide and Carbon Building Chicago and New York In Canada: Canadian Railroad Service Company, Limited, Toronto The word "Oxweld" and the designation "MW" are registered trade-marks of Union Carbide and Carbon Corporation.



SINCE 1912-THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS



DOW PRODUCTS GIVE SIMPLIFIED, ECONOMICAL VEGETATION CONTROL

ESTERON BRUSH KILLER • ESTERON 245 • ESTERON TEN-TEN and DOW SODIUM TCA 90% aid right-of-way maintenance



Photo courtesy of National Aluminate Corporation

When maintenance men and spray service organizations think of chemical brush control on railroad right-of-ways, they think first of Esteron® Brush Killer. Dow research and manufacturing experience have gone all-out to make it the best product in its field. Research like this improves know-how for Dow as well as for manufacturers of special-purpose spray equipment, and for persons responsible for using and recommending chemicals for vegetation control. Esteron Brush Killer contains the highly effective, low-volatility propylene glycol butyl ether esters of 2,4-D and 2,4,5-T. Included in a maintenance program, it gives good control of alder, ash, birch, brambles, cherry, elm,

hickory, maple, oaks, osage orange, poison ivy, sumac, willow and other hard-to-kill species of brush and trees. For certain 2,4-D resistant species, use Esteron® 245 containing these esters of 2,4,5-T only. For deep-rooted perennial weeds, use Esteron® Ten-Ten, new Dow low-volatility ester weed killer. For control of annual and perennial grasses, use Dow Sodium TCA 90%.

Look to Dow for a complete line of vegetation control chemicals. Technical information and assistance is available. The Dow Chemical Company, Agricultural Chemical Department, Midland, Michigan. In Canada: Dow Chemical of Canada, Limited, Toronto, Canada.

you can depend on DOW AGRICULTURAL CHEMICALS



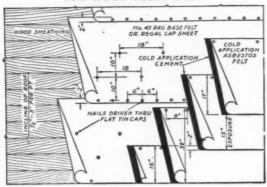
When your hard-to-neach buildings need neroofing





...Johns-Manville Cold Application Built-Up Roofs offer economical application by company crews

FOR WOOD DECKS ONLY



Plan showing method of laying Johns-Manville Cold Application Built-Up Roof.

For further information, regarding this and other types of Johns-Manville roofs, see your J-M Representative, or write Johns-Manville Box 60, New York 16, N. Y.

WHEN reroofing is necessary on small buildings located in remote places along the right of way, it is often impractical to apply the conventional hot application built-up roof.

To meet such conditions, Johns-Manville has developed an Asbestos Cold Application Built-Up Roof. The roof is made up of special Johns-Manville Asbestos Felts that are cemented together in application with a cold applied cement brushed in place.

This eliminates the need for roofing kettles, and saves the time required to heat the binders used when hot application roofs are applied.

Built for long years of service, Johns-Manville Cold Application Built-Up Roofs offer an economical and practical method for roofing small new buildings and replacing those on old buildings.



Johns-Manville

95 YEARS OF SERVICE TO TRANSPORTATION



REVENUE TRAFFIC KEEPS ROLLING. Rechanneling of Prairie Dog Creek proceeded without interrupting railroad schedules as Contractor Poppe's two International crawlers teamed up to excavate 845 cubic yards of sand daily for the new creek bed.

International Crawlers move Prairie Dog Creek 200 feet from Rock Island's main line in 13 days

When rip-rap failed to keep Prairie Dog Creek from eating into the Rock Island roadbed one mile west of Jennings, Kansas, the creek was rechanneled for 1,000 feet and moved 200 feet from the tracks in just 13 working days.

Poppe Construction Company handled the rechanneling project for the railroad and used an International TD-18A with a six-yard scraper and an International TD-14 with dozer to move 11,000 cubic yards of sand excavated for the new 40-foot wide, 8-foot deep creek bed.

Contractor Art Poppe says: "My TD-14 on this job is a 1946 model and still going strong. It worked 4,500 hours on some mighty tough jobs before needing an overhaul. My TD-18A has to pull the scraper with no wheel support at times and that takes real power, but this crawler really is loaded with it. I find all my Internationals are designed and built to last."

Call in your International Industrial Distributor before you buy
that next piece of maintenance-of-way equipment.
Get the details on why you will get greater work
dividends from International "Power That Pays."

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

Keeps Creek from Main Line

INTERNATIONAL POWER THAT PAYS



HANDY AS



On production earthmoving, "D" can be usel on production earthmoving, 'D' can be used in pusher-fleets, or a pair of "D's" equippel with dozer blades can push-load each other. Bulldozer blade can also stockpile coal ... spread ballast . . . handle emergency doing It can also fill around culverts, clean ditches, and handle other dozer essignment. and handle other dozer assignments.

The D

will spe shortest 28 mph

With tu

trols, as most ha ly grind much as

1-REPLACES

2-SUPERIOR 10

A PAIR OF PLIERS!

D Tournapuli speeds both yard and road work

By self-loading, "D" eliminates shovels as multiple haul units. With top speed companie to trucks, Tournapull hauls fast over highway over rough roads and along right-of-way agoes places where a truck cannot. Its is single tires roll over tracks, ties, and rough footing as easily as small tires roll over grade.



LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

SEND NOW TO:

ADDRES

RAILROA







The D Tournapull is one-man work crew which will speed both normal and emergency service anywhere in your division. Ready to work at a moment's notice, this 122 hp machine takes shortest route between jobs at speeds up to 28 mph. It can travel over highway, cross-country or along right-of-way.

Fast moves away from track are readily made at the approach of traffic. Less than a minute after train is past, "D" is back on job. No time is lost dead-heading work train to nearest siding. Through traffic stays on schedule. Wasted work time, headaches of supervision, dispatching, and signaling are eliminated.

Easily mounted, correctly curved V-type Snow Plow, makes "D" efficient for snow service. With power-proportioning differential, unit goes anywhere to open yards, sidings, loading tracks, crossings, access roads . . . saves rail snow plows for main-line plowing. Scraper can also be used to load and haul away snow and ice.

work trains and crews on scattered jobs

to crawler-scrapers or shovels and trucks

With turn radius of 12'8", instant electric controls, and speeds to 28 mph, Tournapull can double or triple output of crawler-scrapers on most hauls. Four tires replace over 500 wearing parts of crawler track assembly which constantly grind in grit . . . outlast a set of tracks as much as 4 to 1 in some soils.

Large, square, top opening allows fast, easy loading of ballast or other material from hopper. Washwater quickly drains away . . . eliminates hauling unnecessary weight. Big 9 ton, 7-yard capacity bowl is unloaded in seconds . . . load can be spread in layers 1" to 26½" deep, or piled in one place.

Tournapull's large bowl carries tools, supplies, and extra fuel to job site. No need to wait for work-train. There are no delays for loading or unloading machine from flat car or trailer, no time wasted planking to take crawlers over tracks. Unproductive time when shovel waits for trucks or cars is eliminated.







Tournapuli, Tournamatic—Trademark Reg. U.S. Pat. Off. DP-361-RI

NAME ..

D

ADDRESS . . .

RAILROAD

..... TITLE

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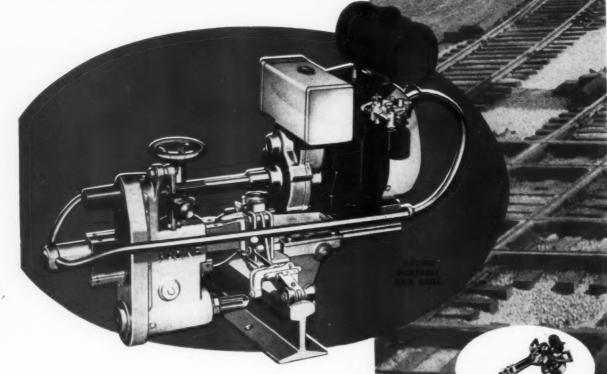
Please tell us more about 9-ton, 122 hp D Tournapull

Also interested in your

You too can reduce track ma

RACINE

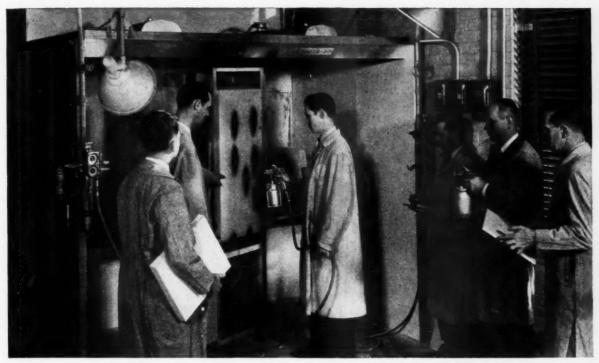




- LIGHT IN WEIGHT (only 165 lbs.) Mounted on rollers without outboard supports, this drill can be handled and operated by one man.
- POWERFUL FAST Finished holes can be made in one to two minutes depending on drill size and web thickness. Handles all size drills — fits all rails.
- AUTOMATIC POWER FEED Special type automatic power feed insures predetermined drilling time per hole. Definite output per man-hour can be established. Drill life is greatly extended because Racine's controlled power feed prevents over-feed and drill breakage.
- PRECISION BUILT An accurate, rugged drill press designed on horizontal lines. Gas-engine powered and built to machine tool precision.

RACINE HYDRAULICS & MACHINERY, INC.





At the tuition-free DeVilbiss School, painters and supervisors learn the latest spray methods and proper techniques.

Here's what we mean by:

"For better service, buy DEVILBISS"

Besides a complete line of precision-made spray-painting equipment, DeVilbiss offers you a host of services that help you get the most out of these prod-

Consider the DeVilbiss School, for example. Located in Toledo, Ohio, it gives a big assist to both painter and employer by offering instruction without cost to new or experienced spray painters and their supervisors.

One-week courses are conducted throughout the year in all phases of refinishing maintenance and production painting. The latest techniques and newest methods are explained, discussed and practiced. Coating materials, surface preparation and maintenance of equipment are also carefully covered,

If you are in any way responsible for a painting operation, it will pay you to find out about

the many advantages of the De-Vilbiss School. To make application or to obtain information and dates of the classes you're interested in, contact your local DeVilbiss jobber or our branch office. Or, write direct to the factory at Toledo, Ohio.

THE DEVILBISS COMPANY Toledo, Ohio

> Windsor, Ontario • London, England Santa Clara, Calif.

For lower costs and higher profits, take advantage of these other DeVilbiss Services:

Rebuilt Exchange Service — Assures added life, prolonged efficiency to all users of DeVilbiss spray guns and compressors.

Training Films — Teach your employees the use and care of spray equipment.

Sales Promotion Aids—For automotive refinishers and contract painters to help them sell their services in newspapers, magazines and direct mail.

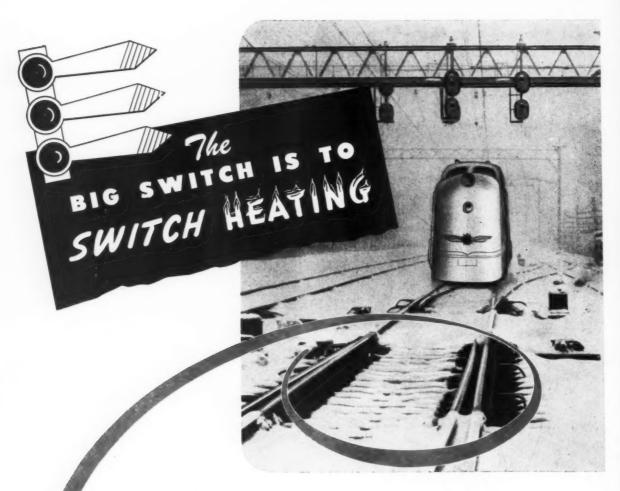
Dependable Service — Local jobber stocks carried at all key points for quick delivery everywhere.

Research — DeVilbiss Research keeps pace with the coating needs of your industry and solves the problems of individual users. DE VILBISS

BRANCH OFFICES AND DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE UNITED STATES, CANADA AND THE WORLD



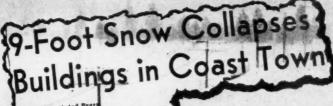




Switch Heating with Protane LP Gas has the enthusiastic approval of railway maintenance executives wherever it is being used. Its high efficiency, tremendous savings over other methods and automatic control have established its superiority. Records of installations currently in operation indicate savings ranging to 75% over older methods. For additional information on how switch heating with Protane LP Gas saves money and man hours, write to:



THE PROTANE CORPORATION
ERIE, PENNSYLVANIA



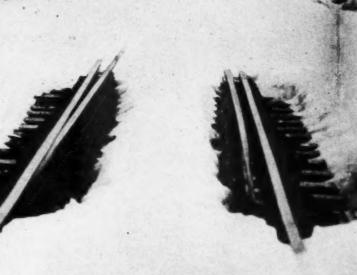
By the Associated Pres
PORTOLA, Calif., Jan. 16.—
This little railroan and lumbering town sought a declaration of emergency today because of a record snowfall that has collapsed buildings, stranded 118 bus passengers and made all emergency equipment useless.

Portola, Calif., Locked 3d Day In 9-Foot Snow

Town Digs Desperately Buildings Cave In, Homes Sag; Buses Strand 118

PORTOLA, Calif., Jan. 16 (P).

—Desperate efforts were being made today to dig this mountain community out of a record snow-fall which has collapsed buildings, caused one death, stranded 115 bus passengers and isolated the community for three days.



It Could Happen Again...

True — 9-ft. snowstorms are a rarity. But snowfall of much lesser depth can cause plenty of trouble for railroads caught short of the proper equipment to deal with it.

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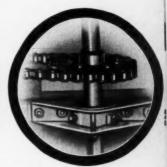
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BAILWAY TRACK and STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET CHICAGO 3. ILL.

August 1, 1953

Subject: New M/W Clubs

Dear Readers:

An interesting--and heartening--phenomenon is taking place in the maintenance-of-way field. We refer to the formation of several new clubs composed of engineering and maintenance-of-way officers and representatives of interested supply companies.

For many years there have been maintenance-of-way clubs in New York and Chicago. For a long time the existence of both these organizations was somewhat of a struggle. The people who were supposed to benefit from membership in them had to be practically brow beaten into becoming members, and those who did join were frequently indifferent about attending the meetings. Several years ago both of these clubs seemed to get a new lease on life. Membership grew and attendance at the meetings improved. This change for the better took place so gradually that it went almost unnoticed. Those who did take cognizance of it were inclined to ascribe the increased interest to improved railroad business and possibly more aggressive leadership in the clubs.

More than a year ago a movement was started to organize an M/W club in St. Louis with the result that the Mississippi Valley Maintenance of Way Club formally came into existence last fall. Early estimates of the membership and attendance were conservative -- too much so in fact. Some of the prognosticators, including this one, were surprised by the enthusiastic way in which the new organization was greeted.

Some of the M/W brethren in the Minneapolis-St. Paul area, and their supply company friends, noting the success of the St. Louis club, decided that they too needed an organization of this sort. Again action was soon forthcoming. A meeting of interested persons was scheduled to be held on July 13. More than 50 railway and supply men turned up, a remarkable attendance considering the fact that the dog days were imminent. The upshot of it was that an organizational meeting will be held on September 24.

What is the significance of this new interest in M/W clubs? To us it seems to be the result of a sort of "ground swell" motivated by several factors. Whatever the source of the movement may be it is certainly an indication of a healthy interest in M/W problems and of a desire to solve them through discussion and exchange of experiences. Essentially, therefore, these clubs have the same objectives as this magazine, and we take this opportunity of welcoming them as allies dedicated to a common cause.

Yours sincerely,

Merwin H. Dick

MHD: 1w

Editor

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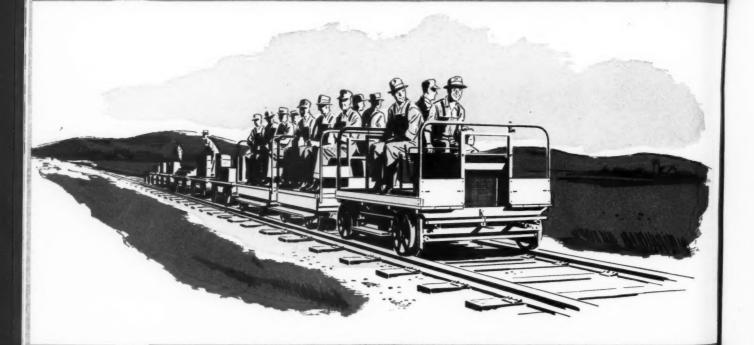
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TRACK and STRUCTURES

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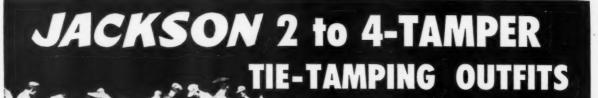
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NOW FASTER, MORE POWERFUL THAN EVER!

The new, much more powerful Power Plant, Model M-22 A which supplants the Model M-20 in the famous Jackson manually guided tamping outfits, permits operating the tampers at several hundred more revolutions per minute than previously. This results in greatly increased tamper efficiency, even though for years Jackson tie tampers have been considered the finest equipment of their type by the vast majority of leading railroads.

Excellent for large jobs, since several may be grouped for any major ballasting or out-of-face operation, they are likewise ideal for low-lift and smoothing work with a small organization using 2 to 4 tampers. Let us show you how maximum results can be most economically achieved with Jackson Tamping Equipment.



ELECTRIC TAMPER & EQUIPMENT CO. Louington, I

CANADIAN REPRESENTATIVES: MUMFORD, MEDLAND, LIMITED-WINNIPEG, MAN.



The Significance of September

September will be the outstanding month of the year for railway supervisory officers in the maintenance-of-way departments. The fact that the Roadmasters' Association and the American Railway Bridge and Building Association will hold their annual conventions at Chicago during that month is sufficient alone to endow it with this distinction. On top of that those attending the conventions will have the opportunity of inspecting at the Coliseum a record array of manufacturers' products.

This magazine believes that every track and bridge and building supervisory officer who can possibly get away from his territory should attend these conventions. Let's put it on a practical basis. Suppose you are a track man. Are you sure that you know how to make the most effective use of on-track tamping machines? Are you familiar with the latest developments in roadbed stabilization? Do you know all there is to know about efficient joint and rail-end

maintenance? No, of course not!
Or perhaps you are a B&B man.
You are unusually well-versed in your
work if there isn't something more

you can learn about the use of power equipment in bridge maintenance, or the selection and training of personnel, or the programming of repairs

and replacements.

Even if you, as a track or B&B man, are right up to date on these and the other practical subjects to be discussed, what about your knowledge of the power equipment and other products available for use in your work? Can you say you are familiar with all the machines, materials and devices that the manufacturers have developed to help you do a better job? We doubt that anyone can make this claim.

Have you made your reservations at the Conrad Hilton? If not, you had better get busy if you want a front row seat when school starts. The dates are September 15 to 17, inclusive, but the exhibit opens on September 14.

Side and Overhead Clearances

No matter how non-restrictive a line or subdivision may be over the majority of its length, the one or few points of limited clearance establish the height or width of revenue loads that may be hauled over it. Too often the limiting factor of a subdivision is the presence of one or two rock cuts which can, without excessive expense, be widened sufficiently to permit the passage of oversized loads. Yet, when the widening of a rock cut is suggested, it is frequently pointed out that the relatively few oversized loads that are offered for shipment do not justify the expense of the work. But who on a railroad can tell of the number of oversized loads that, because of previous rejections, go by highway and are never offered to the rails?

How many railroads actually know where the limiting side and overhead clearances are on a line? Those roads which operate clearance cars do. On many other roads, however, the restrictive points are still based on the results of a survey or of a few measurements made years ago. A survey made at these locations today might reveal entirely different conditions, or might point the way to a simple means, such as the shifting of the track, for obtaining greater clearances.

Tracks are sporadically being relined, raised and surfaced, and the superelevation on curves changed. In this work some clearances are made better and some made worse. Who is watching these effects in the drive to

get the track work done?

It is very easy to overlook clearance features and yet restrictive distances can substantially affect a railroad's revenues and damage claims. One way to be certain of actual clearances is to make new surveys. Other ways are either to rent a clearancemeasuring car from a road that owns one or for several railroads to pool their resources and have a car built.



LEFT—The old ballast was plowed out ahead of the raising gangs by either a short-wing spreader or, as shown here, with a grading blade mounted on a wheel-type tractor. Previously the joints had been removed and packed with grease cakes.

BELOW—Another preliminary step was the loosening of the ballast with a ripper blade mounted on a tractor. This work, and that depicted at the left, was necessary because the ballast was filled with silt that had dried very hard.

Making the First Raise . . .

LOWER LEFT—The raising was done with power jacks and all ties requiring replacement were renewed when the first raise was made. So hard packed was the ballast that spikes sometimes pulled out of the ties when track was jacked. LOWER RIGHT—The first raise was made on the old ballast and amounted to 4 in. or more. This raise was temped with shovels. The gang making the first raise endeavored to stay a day or two ahead of the crew making the second raise.







730 AUGUST, 1953

RAILWAY TRACK and STRUCTURES

How the Union Pacific Is

Reballasting Flooded Track

Flood-damaged main track is being rehabilitated by making two relatively high lifts—the first tamped by hand following the installation of ties, the second by electric vibratory tampers. With every phase of the work geared for speed, as much as a mile of track is completed per day.

• To overcome the damage done to its track as a result of widespread floods that occurred in Kansas in July 1951 the Union Pacific decided to retie and reballast its double-track line throughout the flooded area. Starting in the fall of 1952, two reballasting gangs, working as a unit, were put to work for that purpose just outside Kansas City. This gang completed about 10 miles of double track before winter weather forced the abandonment of the work in that year. Similar gangs were put to work early this year, continuing the work started last fall.

The Kansas division on which this work is in progress is a heavily travelled main line between Kansas City, Mo., and Denver, Colo. It is double track for about 68 miles between Kansas City and Topeka, Kan., on which portion of the line the Chicago, Rock Island & Pacific has trackage rights. In the area affected by the floods the westward track contains 131-lb. rail laid new in 1941, and the eastward track has 133-lb rail which was laid in 1950. Both tracks were last ballasted in 1942 and 1943 with chats, except for about 6 miles which were raised in patches in 1950.

To prepare the track for the current reballasting operations, and to preclude any rail-expansion troubles that might result from joints frozen by flood silt, the reballasting plan provided for the joints to be removed and packed with grease cakes during the winter months. This work progressed as far as possible prior to the start of the raising operations and then continued ahead of both gangs. Two bolting machines were used, one to remove the old bars and the other to tighten the bolts on the repacked joints. This work was accomplished by first applying grease cakes to one extra pair of bars which were applied as soon as the first pair of bars was removed. Grease cakes were then placed on these latter bars which were in turn used to replace the next pair removed. Six men were used for this work, but if the ballasting gang crowded this unit, section forces were pressed into service to keep the joint work well ahead of the raising gang.

Preparations Ahead of Raise

In the area now being raised all but one mile of track was under water during the flood, leaving the track covered with fine silt which dried very hard; so hard, in fact, that, in jacking it up, the spikes sometimes pulled out of the ties. Normal clean-up work after the flood and subsequent weathering had removed all the silt down to the top of the ballast but had left the ballast almost completely filled with it. For this reason all of the shoulder ballast is plowed out ahead of the raising

gangs by either one of two methods: (1) With a short-wing spreader; or (2) with a grading blade attached to a tractor.

Raise First on Old Ballast

After the shoulder has been plowed out and the ballast loosened with a ripper blade mounted on a tractor, the first gang starts to raise the track about four or more inches on the old ballast, or enough to empty the tie cribs. The raising is done with a power jack and the track is tamped with shovels. On this raise all ties requiring replacement are renewed. Over the entire job these renewals are expected to average about 400 to the mile on each track. Following this raising gang a number of men throw the lumps of silt that remain along the inside ends of the ties over on the shoulder and the tractor again blades them over the bank.

The gang making the first raise endeavors to stay about a day or two ahead of the crew making the second raise. This scheme keeps slow orders bunched since the speed of trains is reduced to 10 m.p.h. over the section of "empty" track. When the first gang, which can raise track somewhat faster than the second gang performing the detailed surfacing, is sufficiently ahead of the second gang, it goes back on the next track, usually beyond the machine tamping gang, and proceeds until the electric tampers have caught up to the end of the

This method reduces the amount of open cribs on any one track and thus keeps to the minimum the spread over which slow orders must be issued. It also gives the work train handling ballast a better opportunity of working on both tracks in a more or less circular motion which keeps it out of the way of trains.

The track that is raised by each gang in the morning is filled with ballast in the afternoon by a work train which is called at 9 a.m. out of Kansas City. This calling time gives it an opportunity to pick up the ballast cars wherever they have been set out along the line and to arrive on the job in time to work while first one and then the other gang is at lunch. In a similar manner the track that is raised by either gang in the afternoon is filled before the work train returns. This leaves no empty track overnight. As soon as the work train has filled all empty track on any day, the order is raised from 10 m.p.h. to 40 m.p.h. until raising starts the next day. As before, the track is then placed under a 10-m.p.h. slow order and both gangs work under flag protection.

On the second raise the track is again lifted by a power jack a minimum of 5 in. and a maximum of 8 in. on quartzite ballast which has, as stated, been dragged by the work trains. Tamping is done in this instance by electric vibratory tampers operated by three generators. The track is lined behind these gangs every day with about 12 men doing the work. Sometimes these men are taken from the regular raising gang but more normally the work-train gang is used for that purpose prior to the arrival of the train.

Each of the two raising gangs comprises about 75 men who live in separate camp trains located as close . (Continued on page 733)

Making the Second Raise...

RIGHT—In second raise the track was again lifted by power jack between 5 in. and 8 in. on quartzite ballast dragged after the first raise. Track raised by either gang was filled with ballast the same day. Hence no track was empty overnight.



LEFT—Men with shovels throw ballast into cribs ahead of tampers, and also level ballast off the ties. Here an assitant foreman is sighting raise to spotboard ahead of power jack. The two raising gangs were about the same size.



LOWER LEFT—Second raise was tamped by electric vibratory tampers in two stages. This view shows first stage in which ties are tamped outside the rails. Note push truck in background on which is carried two four-tool generators.

LOWER RIGHT—In second stage the ties are tamped inside rails. Generator for these tools is carried on special three-wheel dolly. In all tamping work the tampers are operated with one insertion only, resulting in rapid progress.





as possible to the work. The men are carried to and from work in trucks, with the starting times of the gangs, and consequently their lunch periods, varying enough so that the number of trucks required is kept at the minimum. This means that the same trucks can handle both gangs.

Making the First Raise

In the first gang two men lead off, handling the two spotboards. Another man follows pulling the spikes from the ties that are to be renewed. The power jack, coming next, requires one operator and two pairs of tampers with shovels. These two pairs of tampers require two nippers using lining bars. A level-board man levels the track at the jack as soon as the sighting rail has been lifted to grade. Most of the work is done by jacking at joints and centers unless the ballast is very heavy and the track is held down at the quarters by caked silt. The holes developed in this way are pulled out by the power jack if bad, or left to a small spotting gang if of a minor nature.

Between the power jack and the assistant foreman who is sighting the raise, four men pull the old ties out and the new ties in. As the old ties are pulled out, three men dig down the tie beds preparing them for the new ties. This work is done without getting in the line of sight of the assistant foreman. Four sets of shovel tampers follow on each rail tamping the outside ends of the ties in pairs. They are followed by four sets of four men tamping the inside portions of the ties. These tampers do not tamp the new ties that have been pulled in unless there are two or more in a row. Following the tampers, spikers put on tie plates and spike the ties, gaging only if four or more ties are installed together,

each side of the new ties. Four men follow behind this group tamping the new ties.

Although about 75 men are carried on the payroll the actual working crew usually consists of about 70 men. This number includes two water men, two operators, two flagmen, one general foreman, one foreman, and two assistant foremen, as well as the men applying grease cakes.

and then only after checking the gage of the track on

Electric Tamper Gang

The gang making the second raise carries just about the same number of men on its roll as the first. As in the first gang, two men operate spotboards ahead of a power jack handled by one machine operator. Four men, working in pairs, tamp by hand the jack ties at joints and centers, with two men nipping them up. As the track is jacked up, 10 shovel men, working four on each side and two in the center, shovel ballast into the cribs for the electric tampers, or level the ballast off the top of ties. These are followed by two men on each side

nipping up "down" ties.

The tamping is done in two stages by the electric tampers. In the first stage they are operated by two four-tool generators moved along on a push truck. This group of tampers works four men on the outside of each rail tamping only the ends of the ties in pairs. If the raise is heavy, four shovel men throw in ballast so that the tampers will always have enough. One of the most interesting portions of this operation is that, even with the raise as high as 5 or 6 in., the electric tamping tools are operated on one insertion only. This means that the work progresses very fast. This one-insertion idea is the result of extensive experiments on the UP.

In the second stage, the ties are tamped inside by four tamping tools powered by a following generator rolling on a specially made three-wheel dolly. When the gang is large enough, the first group of tampers has three sets of two tampers each tamping the outside ends of the ties and the following inside tamping is performed by six men working between the rails. Men handling the tamping tools have replacements who take over periodically so the tools almost never stop.

Like the first hand-raising gang this electric tamping operation is in charge of one foreman and two assistant foremen. The force also includes two water boys and two flagmen. To reduce train delays and thereby speed the work, an operator goes along with the gang getting

lineups on a portable telephone.

The two gangs have staggered working hours with the first gang starting to work at 7:30 a.m. and going to lunch at 11:30, returning to work at 12:30 and continuing until 4:30 p.m. The second gang starts to work at 8 o'clock, goes to lunch at 12, returns to work at 1, and quits work at 5 p.m. With this staggering of starting times the gangs can be taken to and from their individual camp cars at separate locations by the same three two-ton trucks which are fitted with benches on which the men can sit.

Work Train Operation

The work train handling the ballast for each of these gangs is in charge of one foreman and one assistant foreman. The laborers assigned to the work train include those who are not needed on the surfacing gangs. The train is called for 9 a.m. at Kansas City and runs to the reballasting site, picking up about 30 cars of ballast en route, so as to arrive there by the time the first gang goes to lunch at 11:30 a.m. If the two gangs are working on the same track, this means that the work train will have to run through the second gang in order to drag ballast behind the first gang while it is having lunch in the camp cars. Usually this work is accomplished before the first gang comes back from lunch and the work train runs to the nearest crossover, returns and makes a loop so as to drag ballast to fill all tracks which have been tamped that day. Before the work train arrives in the morning and while it is waiting for an opportunity to work in the afternoon, the gang assigned to it spot surfaces, with tamping bars, all hanging quarters that may remain behind the second raise.

Finally the track is dressed so that the ballast is near the top of the tie at its center and about three inches below the top at each end. The shoulder then slopes

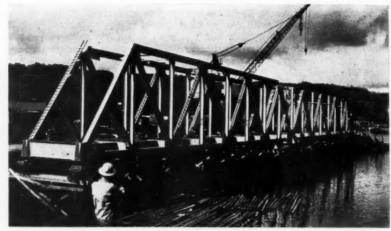
gradually to the subgrade berm.

This work is being carried out under the general guidance of W. C. Perkins, chief engineer, and L. T. Ferguson, engineer of track. The work is under the direct supervision of P. Q. Martin, division engineer, assisted by L. J. Overman, general roadmaster.

Just a Reminder . . .

. . . that the annual convention of the Roadmasters' and the Bridge & Building associations is scheduled for September 15-17 at the Conrad Hilton Hotel, Chicago. An added feature will be the big exhibit sponsored by the Track Supply and Bridge & Building Supply associations, which will be held concurrently at the Coliseum. Be sure and make your hotel reservations early.

When faced with the problem of replacing an old swing span on the same alinement the Great Northern decided that the best procedure would be to erect the new span on false-work at another location and float it to the bridge site on barges, utilizing tidal movements in transferring the load to and from the barges.



NEW SPAN, after erection on falsework driven in Dunawish Waterway, Seattle . .

Erection Problem Solved by

Floating New Swing Span 80 Miles

• Erection of a 368-ft. through-truss span on falsework 80 miles from its final position, transportation of the new span by barge to its place of service, and utilization of the ocean tides in loading the structure onto the barges and unloading it onto the structure—these were the highspots of an unusual bridge project recently carried out on the Great Northern.

The bridge site involved in this project is the crossing

DECEPTION SWINOMISH SLOUGH
PASS

DUWAMISH
WATERWAY

by the GN's Burlington-Anacortes branch line of Swinomish Slough, a navigable arm of salt water which links Padilla and Skagit bays on upper Puget Sound (see map) in western Washington. The crossing at this location consists of a swing span with approaches that give the structure a total length of 834 ft. Renewal of the swing span had become necessary because the old structure, erected in 1891, has become obsolete for present-day loadings. The plan of renewal was to place the new structure on the same alinement as the old one but to position it lengthwise on a new center pier so that the old pivot pier would serve as the end pier at the last approach. A new pier was built to support the west end of the new span.

Because of this arrangement of the new span in the existing alinement it was reasoned that the best procedure would be to erect it elsewhere and float it into position. A primary consideration was the fact that any other method of construction would have required that the branch line be taken out of service for at least two or three weeks.

The actual placement of the new span and the removal of the obsolete span was accomplished within a 12-hr. period, on two successive high tides. Although the complete job took three days—Saturday, Sunday and Monday (June 13–15)—the branch line, which does not operate on week ends, was out of service only one day.

The primary contract for the project was awarded to the Manson Construction & Engineering Co. The Arthur Fralick Company subcontracted the erection work. The site chosen for the fabrication of the span on falsework was a position alongside the Manson Company's pier on the Duwamish waterway at Seattle.

Floated at High Tide

With the riveting completed and part of the bridge machinery installed, the span, weighing 775 tons, was ready to be floated on June 10. With all but the supporting end and center bents of the falsework pulled away, two 120-ft. barges were moved under the span on low tide that morning. At high tide that afternoon



. . . WAS LOADED on barges at high tide on June 10 ready to begin .



. . . THE TRIP to Swinomish Slough where it was . .

the span, 22 ft. wide and 34 ft. high, was riding the waves.

The following afternoon, June 11, stoutly secured to its barges and maneuvered by three tugs, the span was towed out into Elliott bay, at the foot of downtown Seattle. There it began its long trek up Puget Sound to the bridge site, 5½ miles south of Anacortes.

Narrow and hazardous Deception Pass, which links the inner and outer waters of upper Puget Sound, was the trickiest obstacle to the entire movement, which was handled for Manson by the Foss Launch & Tug Co. However, the turbulent waters were smoothly negotiated at low tide the following morning, June 12.

On high tide at 3 a. m., June 13, in a driving rain storm, the span was eased into position over its pivot pier and securely tied, although left maneuverable enough so that it could be inched in any direction. By 5:30 a. m. the gears in the span and the pier had meshed perfectly, and by 6:40 a. m. the span was resting high and dry on the pier.

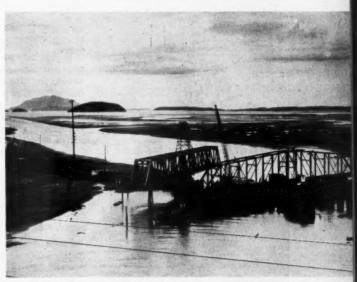
The new pivot pier and the new end pier had been constructed previously just west of the old pivot pier and beneath the old span in closed position. Next the barges were released from the new span and moved into position under the old, which was floated from its pivot pier on the rising tide that afternoon. By 6 p. m. that same day the old span was on its way to Seattle, to be salvaged by the Manson Company.

On June 14 and 15 decking and rails were placed on the new span and work on the timber approaches completed. At 8:30 a. m., June 16, the line was back in service. The new swing draw span will provide a 100-ft. clear channel as compared with the former clearance of 92 ft. The swing span is powered by two 25-hp. motors which can be controlled either from the span itself or remotely from the shore.

Total cost of the unusual project was nearly \$750,000, but even at this figure the cost was estimated to be less than handling by conventional methods.

Don't Forget . . .

... the annual conventions of the Roadmasters' and the Bridge & Building associations, September 15-17, at the Conrad Hilton Hotel, Chicago. Be sure and attend the big supply exhibit to be held concurrently at the Colieum.



. . . UNLOADED on new pier while barges removed old span . . .



. PERMITTING new span to be swung to its final position.



R. W. Torbert





R. R. Clegg



An Invitation to the

September Products Exhibit

TO MEMBERS OF THE ROADMASTERS' ASSOCIATION AND THE BRIDGE & BUILDING ASSOCIATION:

Cordial greetings from our two Supply Associations are extended to the Roadmasters' and Bridge & Building Associations, with best wishes for the success of your coming conventions in Chicago. On Wednesday evening, September 16, our annual banquet will be held at the Conrad Hilton Hotel, to which the members of your two associations and their families are invited to be our guests.

Reflecting an enthusiastic attitude on the part of our members, 123 manufacturers will use 267 booths, all that are available at the Coliseum, for displaying their products—27 of these firms taking part in our exhibition for the first time. At this comprehensive display of equipment, materials, devices and services, you will find many new and interesting exhibits of proven merit—of products that will improve track, bridges and buildings and help reduce maintenance and extend the life of materials. An opportunity is also presented to see and learn direct from the manufacturers what has been done to assist you in your work.

Work equipment will be shown, of both on and off-track types, including yard and ballast cleaners, multiple tampers, cranes, excavators, motor cars, spike pullers, tie removers, rail drills, tractors, bull-dozers, weed killers and mowers, dump and ballast cars, engines and generator sets, in fact, every type of powered machine for doing work rapidly and with saving of labor.

Frogs and switches, rail anchors and spring washers, rail joints, derails, welding equipment, and other appliances of the latest and improved design for the construction of high grade track, will be displayed.

Many firms will show steel buildings, culverts, paint sprayers, rust preventatives, building materials, methods of treating lumber, ties and timbers, air compressors, and numerous other items useful in the construction and economical maintenance of bridges and buildings.

Operating and signal and communications men may inspect the latest equipment in the communications field for expediting movements of trains and distribution of cars in yards. The importance of improved communications is stressed due to its help in reducing to a minimum the unproductive time of gangs and equipment.

Our show will start on Monday, September 14, a day ahead of the conventions, for the benefit of those who can be here on that day to view the show before the beginning of the meetings on Tuesday, and will be opened each day at 9:00 a.m., Chicago Daylight Saving Time. The closing time will be at 5:00 p. m. on Monday and Tuesday, 4:00 p. m. on Wednesday and 12:00 noon on Thursday.

Our wish is that you consider this as a cordial invitation on the part of both of our Associations to you and your assistants and all other interested railroad men to attend the best and most instructive display we have ever presented.

R. W. TORBERT

President
The Track Supply Association

R. R. CLEGG

President
Bridge & Building
Supply Association



OVERHEAD UNLOADING, lack of exposure to fire and dikes around tanks are features of this installation.

Fire Protection at Diesel Facilities . . .

Part II — Fuel-Oil Unloading Tracks

In this installment of his series on how to minimize fire hazards at diesel facilities Mr. Wicker discusses the special conditions encountered at unloading tracks for fuel oil. The specific nature of the fire hazards found at such locations are described and recommendations for overcoming them are given. The next installment will deal with fuel-oil storage and supply tanks.

By W. S. Wicker

Chief Engineer Transportation Mutual Insurance Company Philadelphia, Pa.

◆ The fire hazards of diesel fuelunloading tracks on railroad properties range from excessive spillage and saturation of premises to exposures from open flames in adjacent buildings or makeshift heating appliances, particularly where such tracks are located within shop areas. Careful study should therefore be given to the location of unloading tracks and to the safe handling, through proper facilities, of diesel fuel oil from these tracks to the fueling outlets.

One of the most essential details in connection with diesel operation

is the safe handling of fuel oil. This involves numerous features such as the unloading of tank cars and the proper design and installation of fuel-oil pumphouses, storage tanks, pipe lines, valves and connections. Serious damage to tracks and structures as well as to equipment, can be caused if deposits of oil on the premises should become ignited from any source. The potential causes of ignition of oil-saturated premises are many, including hot coals from steam locomotives, the use of open-flame torches or lanterns around oil-handling facilities and open flames or blazing material from adjacent fires, such as openflame sand dryers in sandhouses, yard heaters or makeshift heating appliances, incinerators located too close to the oil-handling facilities or even rubbish fires.

A special arrangement of the unloading and distributing systems and equipment for diesel fuel oil is necessary to minimize the possibility of spillage and leakage. It is obvious that strict control of the flow of oil is mandatory, for if, through failure of any part of the equipment or installation, oil is permitted to flow freely, extremely hazardous accumulations and the saturation of premises will ensue. Deposits of oil on the ground are a menace to property and equipment and if allowed to remain, create a real fire hazard. If they are ignited from any source the fire will endanger equipment or buildings in the vicinity. This feature has evidently not been sufficiently emphasized to employees. Such deposits are susceptible to ignition at any time. Fires have occurred when hot coals from steam locomotives ignited oil deposits on the ground. Flash fires have occurred in hot weather around diesel fuel-handling facilities caused by oil lanterns, open-flame torches and the flames in the fire boxes of passing steam engines. This further emphasizes the necessity of prohibiting smoking in the vicinity of fuel-handling facilities and of keeping lights and fires away.



SATURATION of the premises is evident at this location where fuel oil is unloaded from the bottom valves.

Tank-car unloading tracks located closer than 100 ft. to any building except fuel-oil pumphouses represents undesirable practice. Each unloading track should be equipped with derails and blue flags, which will prevent train or switching crews placing other cars on tracks during the unloading operations. It is necessary to make adequate provisions to confine or drain off any liquid which may escape through leakage or accident. Level unloading tracks are preferable, for on sloping tracks it is impossible to remove the entire contents of the car, particularly with dome unloading. Tank cars with connections attached after unloading is completed offer additional hazards.

Open flames or spark-emitting devices, permitted in or near any tank car, invite trouble. This precludes the location of sand houses with flame-heated sand dryers adjacent to diesel-oil unloading and fueling facilities. The provision of concrete slabs or aprons over the entire area at fuel-oil unloading tracks, particularly where a large volume of oil is handled, and equipped with proper drains to sumps or oil separators affords the safest type of installation. No matter how frequently oilsoaked ballast is cribbed out and replaced, or is covered with sand to absorb the surplus oil, the hazard will recur after each rain for the oil will float to the surface.

Dome Unloading Is Safest

Dome unloading of tank cars instead of from the bottom outlets is necessary for safety reasons. Un-

loading from bottom outlets is prohibited and dome unloading mandatory in some localities. The only exception is at locations where an overhead catenary in electrified territory might jeopardize the safety of the operator and also cause electrical damage or fire by contact between overhead suction pipes or hoses and the electrical conductors. With the increased use of diesel switching locomotives around railroad properties, however, there is no reason why dome-unloading installations cannot be located on tracks not having overhead wires.

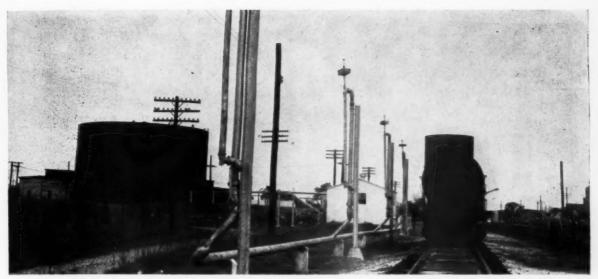
Bottom Unloading

Bottom unloading of diesel fuel from tank cars to storage tanks is always a source of trouble due to unavoidable spillage of oil and the eventual saturation of tracks and premises. Where bottom unloading is mandatory-and there are few places left in railroad shop properties where it cannot be avoidedmetal drip pans are required to prevent saturation of tracks. Spilled oil in drip pans should be immediately removed from the unloading tracks. The covering of oil spilled on ground with dry sand or dirt will relieve the saturation. Some installations have been found where the flash-fire hazards in extremely hot weather are so pronounced that a carload of sand has been piled adjacent to the fuel-handling facilities and scoops provided for resanding or for extinguishing of fires. Even this precaution will not entirely avoid eventual saturation of the premises.

No oil-unloading device is safer than the employee who uses it. The performance of unloading operations by reliable employees, thoroughly trained and properly instructed in safe methods and the hazards involved, is necessary to avoid accidents and to assure among other things that control valves in the domes of tank cars are definitely and properly seated before the outlet caps are removed. Neglect of this detail has been responsible for a serious discharge of fuel oil to adjacent premises. Each attendant should be familiar with the instructions outlined in Pamphlet No. 21 of the Bureau of Explosives for the safe procedure in unloading tank cars. Definite instructions are also found in Association of American Railroad's circulars of the No. 17 Series. The presence of attendants at all times while tank cars are being unloaded is essential.

Eliminate Joints

Diesel fuel oil will seep through the tightest threaded or flanged joints, even when treated with antileak compounds. Much fuel can be saved and fire hazards avoided by welding pipe lines and having as few threaded or flanged joints as possible. Diesel-oil fuel lines, installed above ground on low concrete piers or high steel columns so they can be the more readily checked for leaks or corrosion, are easier to supervise and maintain. Properly installed positive-displacement pumps are the most satisfactory type for transferring fuel oil, and suction hose or aluminum or



DOME-UNLOADING of tank cars is mandatory in some localities. This is a modern fuel-oil unloading installation.

brass pipes are safe attachments for dome unloading of tank cars in that the sparking hazard is reduced.

Approved Motors Needed

The motors of electrically driven pumps should be of a type approved for hazardous atmospheres and remote control, as well as control at the pumps, should be provided. Shut-off valves installed in the discharge lines, at the pumps and at convenient locations near the storage tanks afford positive control of all sections. Where the elevation of the top of storage tank is higher than that of the pump, check valves are required in the discharge line and between the unloading device and pumphouse, particularly where centrifugal pumps are still used. If the check valves are not provided an accidental opening of the shut-off valve at the unloading pipe and of the by-pass valves in the pumphouse will cause oil to back-flow by gravity and saturate the premises. Intermediate shut-of valves are preferable in long pipe lines, the number depending on the length of the line.

A well-designed station would have the dome-unloading device situated near the pumphouse. The pump connections between the unloading track and the main storage tank would be so arranged that the pumps may be used to pump oil from tank car into the storage tanks, from storage tanks to supply tanks, or to the fueling stations, the operation to the fueling stations being governed by remote control switches with pilot indicating lights

located close to the fueling point.

Spark and flame producing equipment should not be permitted in diesel fuel-oil pumphouses or communicating rooms unless of a type approved for Class I, Division 2, Hazardous Locations. This prohibits the use or storage of lanterns, torches and similar lighting appliances, and requires the prohibition of smoking on the premises or adjacent thereto.

If a standby gasoline motor is provided in case of power failure, the gasoline motor should be located in a separate fire-resistive room cut off by a fire wall or a tight partition from the electric motor and pump, and the shaft protected with a suitable flange stuffing box where it passes through fire wall.

A relief valve in a by-pass around the pump and set to prevent dangerous pressures on the line is necessary. Pumps should not be located in rooms with floors below grade. Adequate ventilation of pump room is a safety feature.

Where illumination is necessary at the unloading tracks, electric conduit, wiring and fixtures suitable for use in Class I, Division 2, Hazardous Locations, are required.

Serious fires have resulted from carelessness in the handling of open lights, cigarettes, matches and other sources of flame near where fuel oil has been spilled. At fuel-oil unloading facilities many railroads post conspicuous signs with white letters on fire-department red background, reading:

FLAMMABLE LIQUID
Keep Open Lights and Fire Away
NO SMOKING

Fire extinguishers suitable for Class "B" fires are mandatory at each unloading track, the number being governed by the number of unloading devices. One extinguisher should be placed at every other unloading connection or at some suitable location which is readily accessible. The proper extinguishers for this protection are 30-lb. drychemical or 20-lb. carbon-dioxide units. Extinguishers should be so located at unloading tracks so that it will not be necessary to walk over a car length to secure the equipment.

It is a generally known fact that static electricity may be generated by the motion of anhydrous liquids which have a low electrical conductivity. This includes all petroleum and coal-tar hydrocarbon liguids. The motion may be flow in pipes, flow from a nozzle or hose into a container, or surging or agitation in a tank. A charge may be built up on the pipe line or container to a voltage sufficient to cause a spark to jump to nearby grounded objects. If the liquid of low electrical conductivity also gives off a flammable vapor, the spark may ignite an explosive mixture of the vapor and air. Reference is made to Association of American Railroads' Circulars of the No. 17 Series in connection with the grounding of piping systems, storage tanks and tracks at diesel fuel-handling facilities. Before unloading is started or any connection or contact is made with piping or other equipment, the

^o Class "B" fires are those "inflammable liquids, greases, etc., where a 'blanketing' effect is essential." This definition appears in the AAR's Rules Governing Fire Prevention and Fire Protection.



FOAM-HOSE cabinet (background) and check valve in suction line are among the modern features at this oil pumphouse.

electrical grounding of the tank car to a water pipe or other good ground is desirable.

Contamination of Fuel Oil

It has been found that some of the test samples of diesel fuel oil supplied to the railroads had been taken from tank cars which had apparently been used prior to the fuel oil shipment for handling gasoline or similar low-flash-point liquids. A laboratory made a series of tests to determine just how the flash point of diesel fuel oil would be affected by such minor contamination. The gasoline used in the test was ordinary leaded motor fuel. The interesting results of this test are as follows:

Run No.	Per Cent Gasoline	Per Cent Fuel Oil	Flash Point (deg. F.)
1	0.0	100.0	194
2	0.5	99.5	166
3	1.0	99.0	142
4	1.5	98.5	124
5	2.0	98.0	114
6	2.5	97.5	98
7	3.0	97.0	94
8	3.5	96.5	86

It will be noted that the addition of three per cent of gasoline lowered the flash point of the diesel fuel oil with normal flash point of 194 deg. F. by 100 deg. These results can be verified by any testing laboratory. A series of similar tests on diesel fuel oil with a normal flash point of 120 deg. F. to 125 deg., the minimum flash point now acceptable on a number of railroads, would be interesting, particularly with the view of determining whether such

fuel oil will have proportionally lower-flash points when contaminated with gasoline as shown above.

There is a considerable diversity of opinion about the necessity for bonding and grounding tracks on which tank cars of flammable liquids are handled. It is claimed that such grounds are necessary for gasoline because of the National Fire Protection Association's definition of flammable liquids, but are not necessary for fuel oil. Bonding and grounding are mandatory for maximum protection regardless of the degree of volatility of the liquid to be handled. The question seems particularly pertinent at this time in view of the large volume of diesel fuel oil being handled, the volatility of which is practically that of kerosene although well above the 70-deg. F. flash point usually accepted as a criterion for flammable liquids, and the fact that the flash point of diesel fuel oil may be reduced by occasional contamination. While the flash point is from 120 deg. to 165 deg. F. diesel fuel oil will ignite from molten particles of brake shoes or any open flame, particularly when the ambient temperatures approach or exceed the flash point.

Bonding and Grounding Tracks

For these reasons unloading tracks should be bonded, cross-bonded between the rails, and between the nearest rail and fuel discharge pipes, and effectively grounded. Ground electrodes should be provided at each end of the track.

In electrified territory, on sections of tracks where automatic block signals or Centralized Traffic Control are installed, and at any other location where stray currents may be prevalent, the unloading track insulation is required.

Summary

Summarizing, the hazards of diesel fuel oil unloading tracks should be recognized when installations are considered and the following precautions should be taken:

Keep open lights or fire away. Provide concrete aprons at the larger unloading facilities.

Empty oil drip pans promptly and at a safe location away from facilities.

Make dome-unloading standard practice.

Supervise unloading operations at all times.

Provide electrical installations of a type suitable for hazardous atmospheres.

Bond, cross-bond and ground unloading tracks.

Maintain suitable fire-protection equipment.

What'll You Have?

Whether it be a single, a double, a suite, or what have you—get your hotel reservation in early for the annual conventions of the Roadmasters' and Bridge & Building associations to be held at the Conrad Hilton Hotel, Chicago, September 15-17.



ABOVE—The ability to make out time sheets and labor distribution and material reports is a requisite for the successful yard foreman.

RIGHT—Consideration for the men and an interest in their personal problems and welfare will reflect to the credit of the foreman.

Yard Track Foremen . . .



Are Special Qualifications Needed?

This is the second of three articles on the qualifications needed by yard track foremen. The first, by G. M. O'Rourke, engineer maintenance of way, Illinois Central, was published in the June issue. The third, by J. W. Diffenderfer, supervisor of track, Pennsylvania, will appear in an early issue. All three of them were submitted as answers to a question posed in the "What's the Answer?" department. Other answers to the same question were published in May.

By Malcolm E. Condon

General Yard Foreman Erie, Croxton Yard, Jersey City, N. J.

• The track foreman in a busy yard should be intelligent, with a high school education, or its equivalent. He should be able to read readily, write legibly and speak with relative grammatical clarity. He should be well enough versed in mathematics to quickly make out time sheets, labor distribution and material reports, and to make simple surveys of tracks and turnouts so that accurate field inventories of materials can be developed.

He should be well grounded in

yard-maintenance work and have served at least two years as an assistant foreman in the same or a similar yard. A good foreman depends to a great extent on experience in working out the problems encountered from day to day. More or less standard procedures become necessary in carrying out yard-maintenance work, since yard operations follow a definite pattern day after day. The correlation of these twoyard maintenance and yard operation-is necessary if the highest possible return is to be obtained on the maintenance dollar.

The yard foreman should be a planner—one who decides the day before what he will do the next day

-and one who makes his arrangements accordingly. This usually means advising the yardmaster on what track or turnout the gang will work the next day. The effect of yard operation on the work can be discussed, and plans can be made to minimize the delays. Very often a track can be removed from service for the 8-hr. work period particularly when the yardmaster has 4-hr. advance notice in which to rearrange his normal procedures. Very often, with sufficient notice, yard moves can be rerouted to avoid using a particular switch on which the foreman plans to work. Cooperation with the yardmaster will at least result in the smallest possible number of moves through that particular turnout, and a minimum of lost time will result.

The yard foreman should be able to adjust his day's work readily to meet emergencies or changing conditions which may disrupt well-laid plans on short notice. In yard territory, anything can happen. Emergencies arise frequently. However, there is always maintenance work to be done, if not at the location close by. Under such conditions, it



THE TOOL HOUSE should be ready for inspection every d y at any time. Material storage should be orderly.



A GOOD FOREMAN will make the fullest use of power drills, bolting machines, power saws and other mechanical aids.

is important that the foreman have sufficient flexibility in his thinking and planning to be able to change over from one job to the other, with a minimum of delay. A good foreman always has two or three "fill-in" jobs pretty well thought out, so that when he is forced to abandon the day's planned work, he can swing over quickly to another project.

Practice Human Relations . . .

A good foreman should be personable-able to get along well with his fellow-foremen, his supervisors, and with the men in the other departments-the yardmasters, the switchmen, the car repairmen, the shop men, etc. By working together, helping each other as occasion demands, far more is accomplished with greatest possible efficiency and the least duplication of effort. The foreman who always has a chip on his shoulder meets opposition at every turn. That Biblical phrase, "Do unto others as you would have them do unto you,' could well be the Golden Rule among railroad men in all departments. Its adoption by every railroad employee would result in smoother, safer, more efficient operation, with far less friction, and waste effort. Full cooperation among fellow employees can accomplish so much more, with greater ease and with greater safety.

The yard foreman should be able to handle men well. He should be a leader, rather than a driver. The average yard gang usually includes

an assistant foreman and 6 to 10 men. Proper handling of a group of this size will develop a cooperative spirit which gives a very efficient operation. Consideration for the men, and an interest in their personal problems and welfare, will reflect to the credit of the foreman, and pay off in the form of loyalty and diligence on the part of the trackmen. The laborer appreciates a good foreman, because waste effort, duplication of tasks, and other unnecessary actions are eliminated by good planning, proper supervision, and attention to detail. Have you ever noticed a gang out on a job, perhaps half a mile from the tool house, with one member of the gang sent back after a forgotten tool or a unit of material that should have been placed on the push car that morning? Waste time and waste energy result and this can be translated into dollars wasted. The time thus spent might well have resulted in 8 or 10 more ties being installed, or another panel of track being raised. Proper planning eliminates labor-wasting mistakes.

... Maintain Constant Vigilance ...

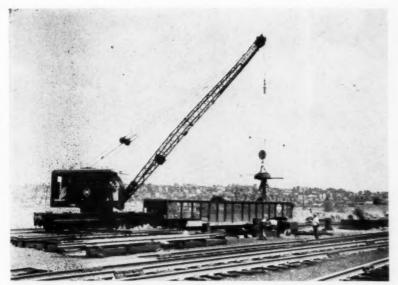
A good yard foreman is quick to recognize dangerous maintenance conditions and correct these conditions before derailments or other accidents occur. Wide gage, head-and web separations, broken points, wide guard rails, loose joints, worn switch point protectors, worn switch stands and other similar maintenance conditions must be

watched and corrective measures programmed before something happens. A derailment or other accident by reason of these conditions can easily cost the railroad many times what the preventive maintenance work should have cost, as well as subject the employees to possible injury.

Such incidents result in yard delays, equipment repair costs, re-placement track-material and labor costs, and other hidden expense which in the aggregate can reach substantial sums. This represents money which could have been used to buy new ties, rail, switches, etc., to improve the maintenance standards of the yard. By maintaining constant vigilance for these maintenance conditions, and correcting them promptly, a good foreman is able to speed the minimum of time on straight maintenance, and the maximum of time in bettering the maintenance standards in effect.

... Be Teacher and Housekeeper ...

A good foreman should be accurate in his work, maintaining quality standards without sacrificing speed or economy in carrying out the work. Proper training of the trackmen so that they are fully acquainted with the standards of quality desired, will permit them to do the best work with the least effort. Proper use of tools and materials, with the elimination of unnecessary breakage or waste, must be part of the foreman's work plan, and must be instilled in the minds



MAXIMUM USE of mechanical equipment should be made to eliminate hand labor in handling material. This results in greater safety and conserves energy.

of workers as well. Working safely is of primary importance, and a good yard foreman must not only be a safe foreman—one who recognizes hazards and avoids them—but must be able to teach his men the same safe practices and then follow up to see that there is no departure from them.

A good yard foreman is a good housekeeper. His tool house should be ready for inspection every day, at any hour. His material storage should be maintained in an orderly manner with items properly identified to avoid selection of the wrong material for a particular job. Nothing can be more disconcerting than to start a job and find that the bolts are too short, or that the angle bars are for the wrong rail section. Proper marking and piling of such materials will eliminate this possibility, and make the taking of inventories a relatively simple task. Good housekeeping is a constant task-one the men can do in the morning while blocked in by yard moves, or at the end of the day's work, and there's still five or ten minutes to go.

... Use Mechanical Aids ...

A good yard foreman utilizes all the mechanical aids available in handling materials, in getting them to the job sites, and in removing the released materials to storage or disposal areas. Planning ahead will often permit the use of a crane to load and unload rails, frogs, switches ties and timber at or near the point of use. Unnecessary hand

tracking is eliminated, and the possibility of delays from train operations in moving such materials on push cars to the site is minimized. In busy yards, particularly, it is important from the safety standpoint that pathways and work areas used by the switchmen be kept clear. For this reason it is not always possible to distribute materials very far in advance of the work progress. Hand trucking then becomes necessary, both to bring in the replacement materials, and to remove the released materials at the end of the day's work. However, the fullest use of mechanized equipment should be made to eliminate hand labor in handing material on every occasion. Such handling results in greater safety, and conserves the men's energies for manual tasks where mechanical assistance is not available.

A good foreman anticipates his use of materials, and asks for mechanical help, such as a crane for handling materials, when such equipment is at hand. Mechanized units are often shared with other sections or subdivisions, and may not be on hand if a foreman should wait until the final day to ask for its use.

A good foreman will make the fullest possible use of bolt machine power drills, power saws, and other similar tools and equipment, when such equipment can be utilized to advantage in replacing hand operations. In many cases, power units cannot be used readily in the track, as in the renewal of rail, frog switch points, etc., in an active yard-

switching territory. However, these same tools can be used very well to pre-cut and drill rails out of the track before installation under the same conditions of traffic. With all of the replacement materials on hand, and the rails cut and drilled, the actual installation can be made in minimum of time. Rail grinders can be used advantageously to remove overflow on stock rails, preventing broken points, and saving welder time. Unit tampers can be utilized around interlocking plants at the frogs and switches, saving much tamping time over hand methods. Time saved through the use of power equipment is money saved to buy improved materials, to provide enlarged work programs, to raise maintenance standards gener-

... and Exercise Common Sense

Lastly, a good yard foreman must exercise good common sense in carrying out his work from day to day. Being alert to changes in plans, quick to seize new opportunities, observant in his inspection of the work in progress and in maintenance conditions throughout his section, he will be an asset to his company, and gain the high regard of his fellow employees. There is much satisfaction in being able to say at the close of the day's work: "We've done a good job today—safely and efficiently."

It will be said, in reviewing this article, that a yard foreman who had all these qualifications and attributes would be a "superman" in track maintenance work. True enough. Perhaps these qualifications are too severe, but they do serve as a criterion—a yardstick—to point out in what respects a particular foreman may be weak, and in what respects he is "filling the bill," and doing his job well.

Remember . . .

reservations for the annual concurrent conventions of the Roadmasters' Association and the Bridge & Building Association to be held September 15-17 at the Conrad Hilton Hotel in Chicago. Remember also that this is exhibit year and the supply associations are presenting a mammoth exhibit of materials and equipment for you. Exhibit will be held, as usual, at the Coliseum.



THE LAST TRAIN to pass through the portals of Tunnel 41 was the westbound California Zephyr shown here.



DRILLING one of the 71 separate holes into which a total of 5 tons of explosive was placed for the blast.

With One Mighty Blast -

D&RGW Daylights 42-year Old Tunnel

• Old Tunnel 41, located about 114 miles west of Denver swallowed some 500,000 trains before it developed ulcers requiring its removal in a major blasting operation. Perched on a narrow shelf above the Colorado river in picturesque Gore canyon, this bore had become a consistent headache to the road's officers despite its mere 65-ft. length. For, it seemed, Tunnel 41 was a rather unsteady creature. Because of a fault in the granite rock mass through which the tunnel passed, it had to be watched constantly lest rock fragments fall on the track. Last year, however, A. E. Perlman, executive vice-president of the D&RGW, decided the unhealthy situation had existed long enough, and drastic "surgery" was needed. A contract for daylighting the

A contract for daylighting the bore was let and the contractor immediately began a study of the rock formation at the tunnel. On that basis it was first decided that approximately 8,000 lb. of explosive, placed in 71 separate holes,

would do the job.

A total of 10 days was spent in preparation for the big blast, during which time 2,139 ft. of borings were made, the majority of them being 3 in. in diameter. In all, 37 holes were drilled on the east side of the tunnel, 27 on the west side, and seven on top. The deepest hole drilled extended 55 ft.

Charge Increased to 5 Tons

Fresh blasting gelatin, made only the week before in Joplin, Mo., was packed into the holes on the morning of the day the blast was to take place. Further investigation showed that the original 8,000-lb. charge would not be sufficient to produce the desired results. An additional 2,000 lb. of ex-

plosive was consequently added, bringing the total charge to 5 tons. No detonation caps were placed at the charges. Instead, as a safety precaution, high-speed detonating fuses were used. The fuses from each charge were joined together at a point where a single cap was to be placed immediately prior to the blast. This cap was then electrically connected to the plunger which was to be operated from behind the scoop of a power shovel.

After the preliminary arrangements had been completed, it was necessary to wait until the daily westbound California Zephyr passed through the tunnel. No sooner had the train passed than technicians swarmed into the tunnel to make last minute preparations. The detonating cap was connected. Railroad officials, newsmen, and other persons on the scene, who had long since departed to positions



20,000 TONS of granite were dislodged by the mighty blast which threw rock fragments as far as 1600 ft.

of safety, watched as the technicians left the tunnel, walked up the track to the power shovel and connected the plunger.

Seconds later all hell broke loose

Seconds later all hell broke loose as rock fragments were thrown as far as 1,600 ft. from the tunnel. In all, it was estimated that some 20,000 tons of granite were dislodged by the blast.

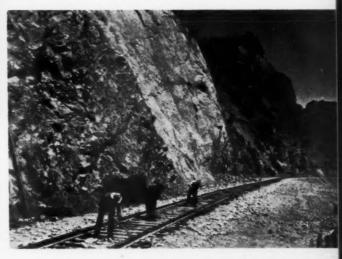
Track Cleared in Six Hours

As the dust settled, bulldozers and power shovels moved in to clear the debris from the track. Just a little more than six hours after the blast, the track was again in service and the eastbound California Zephyr passed through. In the process the track was shifted slightly the roadway widened.

The project was under the general supervision of Mr. Perlman, K. L. Moriarty, general manager, and John Ayer, Jr., chief engineer. Supervising railroad forces at the site were L. B. Coleman, division superintendent, E. H. Waring, division engineer, and G. S. D. McCall and Hubert Meek, roadmasters. The contractor was Morrison-Knudsen. Ben Arp of Denver was project foreman for the contractor.



IMMEDIATELY AFTER the blast, men and equipment moved in to remove the debris and clear the track for traffic.



RIGHT—Track was moved away from the face of the newly-formed cliff after the blast, which, in addition to eliminating the tunnel, widened the roadway slightly.



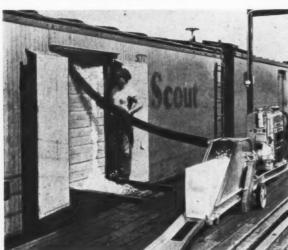
ONLY SIX HOURS after the blast, the track had been cleared and the eastbound California Zephyr passed through.

News Briefs in Pictures ...

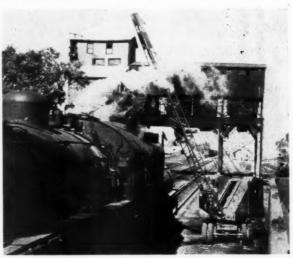
RIGHT—A block-long bridge span for the Milwaukee's mile-long bridge over the Missouri river near Chamberlain, S. D., is shown here assembled for "match marking" in the gantry yard of the U. S. Steel Corporation's American Bridge Division plant at Gary, Ind. The span, 372 ft. long, 56 ft. high, and weighing 875 tons, will be disassembled after matching and marking and the members shipped by rail to the site.



LEFT—New board of director's room for the Santa Fe features all custom made furniture from designs prepared in the road's architectural office. The table is elliptical, allowing each person to see the faces of others seated around it. The inside of the double windows is glazed with light-diffusing glass. Entire room is finished in Early American Walnut.



A NEW heavy duty ice slinger for top or body icing of perishable produce in refrigerator cars, recently introduced by the Link-Belt Company, Chicago. The machine, known as the Series 500, is available in either portable (as shown here) or stationary models, powered by either a gasoline engine or an electric motor. Normal ice handling capacity is 45 tons per hour.



THE UNION PACIFIC, faced recently with a temporary delay in the unloading of coal in its Gothenburg, Neb., yard, called upon the truck-mounted Shield Bantam clamshell shown here to keep schedules moving. The clamshell, owned by contractors, Mahr & Pierce of Lexington, Neb., loaded directly from gondolas into tenders as trains graived.



WHAT'S THE ANSWER?...

. a forum on track, bridge, building and water service problems

Placing Corrugated Pipe Culverts

In placing corrugated pipe culverts in new or old fills what methods produce the best results? What specific precautions are necessary in each case? Explain in detail.

Use Sound Engineering Judgment

By W. T. ADAMS Specification Engineer, Armco Drainage & Metal Products, Inc., Middletown, Ohio

Progressive railroads are faced with the double-barreled question of how to properly install corrugated metal structures in both new and old fills. Construction methods change with the development of new earth moving and other equipment but the best methods of installing structures are based upon sound established engineering practices. This applies equally well to structures placed in new fills, whether on line changes or trestle and bridge replacements, and when providing additional openings in old fills or when strengthening exisiting structures.

The first problem to be solved is that of selecting from the 6-in. to 180-in. pipe-size range, the cross-sectional area that will carry the computed runoff, using single or multiple installations of round pipe or pipe arches so that the embankment or adjacent property is

not damaged by high water.
Selecting the proper gage of metal and choosing the method of installing the structure is all subject to sound engineering judgment. Figure 1 shows how the same size and gage of corrugated metal pipe can be made to carry different amounts of dead load with the same factor of safety. Elliptical shaping and wire or rod strutting is done in the fabricating shop. Timber strutting is installed in the field after the pipe has been laid, before the backfilling is started.

It has been established that a flexible structure develops side support by utilization of the passive earth pressure as the vertical diameter decreases and the horizontal diameter increases under the earth load. The designer can take advantage of this fact and increase the load carrying ability of the corrugated metal structure by specifying that it be installed with the vertical diameter elongated. Gage requirements, as normally specified, assume that the pipe will deflect 5 per cent from its normal diameter; therefore, an increase in the vertical diameter during installation will permit the pipe to carry more load than if it had started out round. A flexible pipe can have its load-carrying capacity increased to a still higher value if timber struts, designed to carry the earth load on the pipe, are installed to help maintain the elliptical shape while the fill is being placed.

It is very important with any type of strutting that the pipe be permitted to deflect slowly as the load is applied. In timber strutting, a soft wood compression cap must be used between the vertical posts and top sills.

Recognizing that a flexible corrugated metal structure will adjust its shape to fit the load conditions, inspection of the structure while the embankment is being placed over it will show how the structure is performing and how well the backfill has been placed. A good finished structure is the result of careful installation with adequate supervision of all operations during the placement.

Suitable precautions must be taken to see that the best methods of backfilling are used if a corrugated metal structure is to develop its maximum load-carrying capacity. The backfill should be made with selected material, preferably granular, placed in horizontal layers and well compacted. The compacted material on each side of the structure should extend to the

Answers to the following questions are solicited from readers. They should be addressed to the Whats' the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago J, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the November Issue

1. What problems in maintaining a track may be encountered when ridges of heaved material along the shoulders are removed? How can these problems be overcome? What measures can be taken to prevent further heaving of this nature?

2. What materials and types of construction give the best results in avoiding fires and fire damage in the vicinity of roof ventilators in diesel shops? Explain.

3. When designing new yard layouts what figure should be used as the average car length for computing the capacity of the track? How is this average car length determined?

4. What measures can be taken to prevent the clogging of weep holes in concrete slab bridges? How can these holes best be opened after they have become clogged?

5. Under what conditions, if any, is it desirable to use a standard guardrail with a self-guarded frog? Why?

6. What types of portable power tools and equipment are considered essential for use by water service repairmen? What other types are also desirable? Explain.

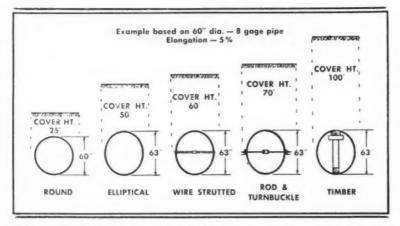


FIGURE 1—The same size of corrugated pipe can be made to carry different dead loads with the same safety factor by the methods shown here.

sides of the trench, to natural firm ground, or have a sufficient mass to support the fill loads over the structure. While a small area immediately adjacent to the structure will need some hand tamping, the important point is to obtain a compact mass on each side of the structure having a width not less than the diameter of the pipe.

well-placed thoroughly tamped backfill can be built economically and quickly with modern construction equipment. Suitable backfill material is generally available near the site of the drainage structure. While granular soils are preferred, most local materials can be made to work if they are properly handled. Do not use frozen earth, sod, cinders or earth containing a high percentage of organic material. Pnuematic tampers make it easy to thoroughly compact the fill adjacent to a structure or between closely spaced parallel structures. Modern earth moving equipment can place the backfill in shallow uniform layers and a compacting roller will assure a dense, stable fill.

Drainage structures should be installed on stable foundations of nearly uniform density. Soft foundations need to be stabilized with granular material and ledge rock or boulders must be excavated below grade and backfilled with earth to provide a firm and uniform foundation. Under high fills, where subsidence of the foundation is expected, the flow line of the structure may be installed on a cambered grade to avoid the formation of low pockets in the flow line of the finished structure. Multiple structures should be separated to allow room for tamping under the haunches of the structures. Where

stream and topography conditions permit, it is often advantageous to separate the structures enough to permit earth-moving equipment to be driven between them.

End dumping of fill material into short high fills or dumping through trestles can cause slides and structural difficulties unless care is taken to distribute the fill materials properly in horizontal layers. Here a bulldozer can be used to good advantage. Seepage zones are often encountered where high fills join natural slopes and these wet areas must be well drained to avoid fill difficulties.

It is important to protect drainage structures during construction from the heavy wheel loads of construction equipment. Providing extra fill over the structure before the equipment is permitted to cross is a simple way to protect against such damage by excessive loads.

When a new opening is required in an existing fill or under live track, the open trench will be the most satisfactory method of installation when the diameters are small and the cover is shallow. Proper precautions will have to be taken to avoid interference with traffic, and extra care is needed in backfilling to prevent future settlement of the track.

Where the size of the opening required is between 30 in. and 66 in. in diameter, jacking can be successfully carried on in almost any soil that will "hold a face" when excavated and which is not waterlogged. It should not be attempted in dry sand or gravelly soil that is known to contain large boulders, through fills where logs or stumps are known to exist, or where it is impractical or uneco-

nomical to lower the water table below the excavation. Jacking should generally be limited to lengths of approximately 80 ft. While longer lengths have been jacked under the best of soil conditions it is generally more economical to tunnel or combine tunneling and jacking for the longer lines. Jacking usually requires a minimum of 4 ft. of cover over the top of the conduit under the tracks. More cover is necessary in loose soils to prevent freezing of the pipe due to ravelling of the fill.

The tunnel method of installation should be used when large diameter or very long structures are required under high fills or under multiple tracks where the traffic must be maintained without interruption or where the soil conditions are not suitable for jacking. Standard tunnel liner plates are available in a full range of sizes and shapes.

When either jacking or tunneling is under consideration as a method of installation, it is always wise to determine the soil conditions by boring or sampling before the method of installation is decided upon.

When jacking under low fills or through native soil, a working pit is necessary with dimensions that will allow free working room for the men and equipment. The working pit should be securely shored or sloped at angles that make caving or sloughing of the embankment impossible. Certain state construction regulations control very definitely the degree of shoring required.

Jacking requires the installation of back stops capable of supporting the thrust required to overcome the jacking resistance. The timber or guides that support the conduit as it enters the bore must be accurately placed on the re-



SOFT WOOD compression cap must be used in timber strutting.

quired line and grade as they control the direction of the conduit. Jacks should have a minimum capacity of 35 tons each, should be of a type that can be operated on their sides and have a minimum travel of 13 in. They are generally worked in pairs. Air-operated jacks do a good job, particularly if a compressor is also required for the operation of air spades in excavation, etc. The major precautions necessary for a successful jacking job are: Keep pipe moving; keep hole small; backfill tightly.

Working crews should be arranged to provide a nearly continuous jacking operation. Just how far

the excavation can be safely carried ahead of the structure depends on the nature of the soil, the amount of cover, and the tools used in the work, but rarely should it exceed 12 to 18 in. Best results are obtained if the excavation is just about one inch larger than the outside diameter of the conduit at the top and tapered off towards the invert. Small relief pits are excavated at 10-ft. to 20-ft. intervals below the invert elevation to pick up the material that may be carried along with the pipe. Generally one section on each end of the jacked pipe is installed by the open-trench method. Careful

tamping of the backfill around these end sections will prevent flow around the outside of the jacked pipe which might cause washouts.

Pipe for jacking requires special fabrication and should be specified for jacking on the purchase order. It is essential that the pipe be shop-punched and match-marked for field connections and a special jacking band is advantageous on the jacking end of the pipe. Where granular material is encountered or when bituminous coated pipe is to be jacked, skin plates should be supplied for the top and bottom of the pipe.

Transporting Motor Cars on Highways

Under what circumstances is it advantageous to transport motor cars on highways? To what extent can small twowheel trailers be used for this purpose? With what accessories should the trailers be equipped? Explain.

Provides Best Method

By C. T. BLUME General Supervisor of Work Equipment, St. Louis-San Francisco, Springfield, Mo.

The transporting of track motor cars by means of highway trailers is more effective in promoting efficiency in the performance of truck operating units (crews or gangs) than any other supply method familiar to the writer.

Extensive study has been given to the subject of track motor-car availability at the locations required. There are several approaches to the problem and three methods have been rather generally applied—(1) access roadways, (2) relay track motor cars stationed at desirable locations, and (3) the highway trailer.

A dirt access roadway is generally the type provided on the railroad right of way. Heavy maintenance is necessary due to the unimproved type of construction, infrequent use in certain sections and the light traffic to which they are subjected. Such maintenance can quite readily engage the service of a road grader many days annually. The roadway may be fully or partly impassable a number of days annually. The condition can be expected to cause premature service expectancy of the trucks and to impair the efficiency of the unit.

There may be a justification for the use of railroad right-of-way access roadways on territories with few and far distant crossings. When such conditions do exist, it is doubtful that the territory is suitable for an efficient truck operation, but if employed there is possibly no alternative to using a railroad right-of-way access roadway. All-weather roadways adjacent to the railroad present a more favorable condition in comparison to the right-of-way roadway. There is no railroad maintenance expense and the roadway conditions are generally better. However, track motor cars are still a requisite.

There may be areas on a railroad right of way which are occasionally in a condition to serve as a vehicle roadway. It is difficult to refrain from driving in such rough locations and, where such driving is practiced, vehicle abuse will surely occur. The ultimate result involves delays to the unit and excessive vehicle maintenance. The tires are not worn, but rather are torn to the point of requiring renewal and spring, power-train and axle failures are common under such driving conditions.

A territory suitable for the use of trucks is one providing all-weather roadways to the railway at reasonable distances. If this is not possible, the territory does not have the essential characteristics to justify the method and such a system will prove expensive.

One means of providing track motor cars at desirable locations is

to station relay cars at well selected roadway crossings, or at the headquarters of each unit. This presents a relay operation similar in the results to the highwaytrailer system, but more equipment is required. The stations are lo-cated with the thought of achieving the minimum track motor-car travel to those work locations remotely located with respect to the roadways. Possibly a small car shed may be used to protect the cars at each station, or the equipment may be merely protected with a canvas cover when idle. Obviously, such motor and push cars are subjected to infrequent service. The result is rapid equipment depreciation with a maintenance problem that substantially increases the equipment ownership

The highway-trailer method is far more efficient than the other two mentioned. A pneumatictired, two-wheel trailer reduces the number of track motor and push cars required by a truck unit to the absolute minimum. The equipment is available with the truck when required, equipment maintenance is at a minimum and the equipment service expectancy and the unit progress is normal. The trucks are not subjected to the abuse experienced with other methods if the specific territory has the characteristics of a sound truck unit operation.

The trailers can be used for many services other than transporting track motor cars. Small roadway machines, tools, track fastenings and similar equipment and materials that are required can be moved to work locations most efficiently by the combination trailer-and-truck method.

Although ownership costs will vary on various railroads the highway trailer method is definitely superior to any developed to date with respect to service requisites and other considerations. The equipment ownership ratio will average at least two to one in favor of the highway trailer as compared to the other methods mentioned and the personnel performance is hetter.

The trailers used should be sturdy in construction and light in weight. A low, well-designed type trailer is suggested as preferable when road clearances permit, as equipment and materials handling is thus eased. However, road clearance is of the primary importance and in certain applications the high type should be used to meet

the existing road conditions. The four-wheel-type trailer is not suitable because of its adverse maneuverability, and the safety hazard which it creates on grades, slippery roadways and similar road irregularities. This type is illegal in the states of Alabama, Connecticut, Iowa and Kentucky and it is my thought other states may do well to enact laws prohibiting its use.

Trailer brakes are not required in a number of states, unless the gross vehicle weight exceeds 3,000 lb. Some states do require brakes when this weight exceeds 1,500 lb. We recommend brakes on all trailers irrespective of their weight capacity. The electric brake is quite applicable to the light trailers and provides satisfactory service at nominal expenditure.

The average truck-operating unit will frequently require a push or trailer car to supplement the motor car. A push car of the partially folding type which opens to standard size is suggested, as it materially reduces the length of the trailer necessary in simultaneously transporting a track motor and push car.

Experience with the trailers has shown that very few accessories are normally required. The ones found to be of the most value are the boomer (load binder) which is used to secure all loads for safe highway movement and lightweight removable stakes. The stakes are essential to the safe transporting of high loads within the dimensions and load capacity of the trailer.

Welding Switch Points in Track

How can switch points be welded effectively in track? What determines the success of this method of reconditioning points? Explain. Can welding be performed at main-track switches as well as in yards? Explain.

Maintain Good Fit

By TRACK REPAIRMAN

Before beginning to weld a switch point examine for cracks and strike any suspicious-looking spots with a hammer. Break, grind or melt out all unsound metal. If the stock rail is overflowed or flange worn it should be ground square or changed, and switch should be in proper adjustment.

Where the switch point is worn thin, but shows no cracks, the following procedure should be fol-lowed: Line switch so point to be welded is against stock rail; apply metal in horizontal beads beginning at the bottom; when as much metal as can be kept hot has been added, flow and hammer smooth and finish with flatter. The end of the point should be ¼ in. lower than the stock rail with an 8-in. runoff to the top of the rail. If any hammering is done on the top with the point open it should be followed by hammering on the side with the point closed to correct any bending or upsetting that might cause a poor fit of point to stock rail. Points welded in this manner give excellent service in the as-welded condition, even under heavy traffic.

Where the point is in such a condition that the end must be formed entirely of weld metal, the ragged and broken edges should be ground smooth to about 1/8 in. thick. With the point open add metal to the %-in, thick edge in beads one on top of the other. Care must be taken to break the scale on deposited metal and work out all holes. When as much metal as can be handled has been added. flow the side that will come against the stock rail smooth, be sure no excess metal has run down on the reinforcement, close the point, be sure the metal is at forging heat and shape by hammering against the stock rail. This makes a good smooth surface to bear against the stock rail. The face of the point is then finished in the usual man-

If such a point is left as welded, the all-weld-metal part of it will be found to be brittle. One naturally thinks of annealing, so with a No. 80 nozzle or larger heat about 12 in. of the end red hot. Move the flame back and forth over the hot metal gradually drawing it away so that the metal will cool slowly. Such points will give fairly good service under moderate traffic, but are not entirely satisfactory. Points with all-weld-metal ends welded out of track and packed in asbestos after reheating so they take several hours to cool have given excellent service under heavy traffic, sometimes even outlasting new points, but such annealing is not practical in track because of traffic.

Hazardous in Main-Line Track

By L. E. DONOVAN
Assistant Engineer Maintenance of Way,
Illinois Central, Chicago

This type of work pays dividends in yards. In locations, however, where switching movements are frequent or almost continuous it presents a problem for the welder but, on the other hand, if switching is only intermittent and the welder is able to work 15 or 20 min. at a time, the work can be performed successfully.

Before a switch point is repaired, all flow on the stock rail and back of the point should be removed by grinding and the points adjusted so that a good fit is obtained. Should any switching take place during the process of welding, the weld should be tapered off and allowed first to cool for a few minutes before permitting cars to roll over it. After the welding is completed the point should be reheated and some heat also applied farther back at the base of the point to relieve any slight warpage due to welding. After the point has cooled it should be finish ground if a grinder is available; if not, the point can be finished with a rail flatter, but grinding produces the better job.

If possible, points should be welded before any advance wear takes place, generally not to exceed 10 in. to 12 in. If the stock rail is worn flat and thin, it should be changed prior to welding. The success, therefore, of reconditioning switch points in track is governed to a large extent by the fore-

going.

Welding points in main track has not been an accepted practice on the Illinois Central. We are of the opinion that there is too much hazard involved in doing so, particularly on those points located on the running side. It is true that points on the turnout side, perhaps, could be built up, depending, of course, on train movement through the turnout, but thus far we have seen fit to change out all worn points in main-line track. Points so removed in many cases are forwarded to one of our welding shops, which are located at strategic points over the railroad, where repairs are made to both frogs and switches.

track should be taken into consideration. On heavy switch leads or busy main-line tracks the welding of points should not be attempted.

Switch points should be welded before they have become worn too much, for in track welding the principal precaution is to make sure that the stock rail is in good condition. If there is any overflow of metal, this should be ground away before the weld is started. Then the point should be adjusted so that it fits tightly against the rail. It should then be built up so that it is slightly lower than the running surface of the stock rail. After the weld is completed, the point should be finished off with a grinder. This is not absolutely necessary in yards if the work has been done carefully and neatly. Be sure to use a welding rod that is made for frog and switch-point welding.

Follow Definite Procedure

By J. P. DATESMAN '
Engineer of Track,'
Chicago & North Western, Chicago

Switch points in main-line and yard tracks can be welded effectively by regular division welders who have been properly instructed as to the procedure to be followed.

The fatigue metal on the top of the point can be removed either by grinding or cutting off with a cutting torch. After all fatigue metal has been removed the point can be welded either against the stock rail or away from it, but in both procedures the switch point is placed against the stock rail at various times for the proper forming of the point.

Welding operations in most cases should be started at the heel end of the switch point, and the work progressed towards the point, building from the bottom upwards. The point should be completed to the standard thickness on the top, and be rounded to the standard radius on the end. After the welding has been completed, heat should be applied at the base of the switch point so as to pull out any bends which may have formed in the process.

The same procedure can be followed on both main-line and sidetrack switch points. All side flow on the switch point and adjoining stock rail should either be trimmed off with a torch, or ground off with a flexible shaft grinder, and this same machine should also be used to finish and smooth up the welded surface on the switch point.

The success of building up switch points or doing any other welding work depends of course upon the ability of the welder, but if he has been properly instructed I know of no reason why this work should not be carried out. There is, of course, a limit to the number of times that a switch point can be built up, which is controlled by the general wear on the point.

It is sometimes necessary to straighten switch points both vertically and laterally before the welding operation begins, but this can be accomplished by the proper application of heat, together with the necessary normalizing to elimi-

nate brittleness.

Impractical Under Heavy Traffic By Charles Wise

By Charles Wise Track Welder, Chicago & North Western, Chicago

Switch points can be welded effectively in track by using an appropriate welding technique. Modern methods of welding can make a point that is worn, but still in condition to function safely in the track, as good as new, if not better, since the worn point has been cold rolled and stressed sufficiently by traffic to develop any defects which it may have possessed. Of course, traffic conditions over the

Drying Characteristics of Engine Sand

To what extent do the physical charactertistics of engine sand affect the time required to dry it satisfactorily. Should those characteristics be known before deciding on the size and type of dryer to be installed in a new facility? Why? Explain.

Know Characteristics

By J. Y. NEAL Principal Assistant Engineer, Norfolk & Western, Roanoke, Va.

The physical characteristics of engine sand would materially affect its drying time. If, for instance, a clean, relatively pure quartz sand, with a high uniformity coefficient as to particle size, is being dried, the minimum time would be required. If, on the other hand, a sand containing considerable quantities of organic matter, fines, clay, etc., is being dried, a much longer period would be required. A sand of this sort would also have a much greater tendency to cake than the clean uniform quartz sand.

It is my opinion that the physical characteristics of the sand should definitely be known and fully considered in deciding upon the size and type of drier to be installed in connection with a new facility. It, of course, would always be desirable to use the clean, uniform type sand with the lowest possible percentage of fines and clay—if available.

Surface Area Critical

By RAYMOND WAGNER
Chief Engineer,
Roberts & Schaefer Co., Chicago

There is no question but that the physical characteristics of engine sand affect the time required to dry it satisfactorily. Over the number of years that the Roberts & Schaefer Co. has been designing and building sanding equipment

for the railroads, we have been able to gather a vast number of general observations. Unfortunately, we have never been able to make any kind of a comprehensive test at a given installation with more than one type of sand. It seems that it would be very desirable for each railroad to experiment with various specification sands to determine which would give the best results in drying. Such experimentation should lead to economies in the fuel consumed, especially with a more modern, oil-

burning, automatic drier. It should also lead to increased capacity of present drying units. Primarily, the surface area, which determines the amount of water retained on the sand, is the critical factor to be evaluated. Surface area will vary with the grain size distribution, for a given shape of sand grain.

Free-flowing characteristics are important. Permeability of the sand mass, to allow the escape of water vapor, may influence the results with some dryers. In general, however, the escape of vapor must

be as direct as possible to the surrounding air, since vapor (and heat) will not pass through any appreciable thickness of sand, no matter what its characteristics, in a reasonable time.

Problems of drying frozen sand, or water-soaked sand, may also be tied into the physical characteristics, but are aggravated conditions of the general problem. It should be a decided advantage to the railroads to know the characteristics of the sand before deciding on the size and type of dryer.

Safe Flat Car Loading of Rail

When loading rails on flat cars for shipment in "revenue" trains, what precautions must be observed to assure safety in transit? How can such rails be tied down effectively? Explain.

Comply with AAR Rules

By Supervisor

When rail is loaded on flat cars for shipment in any class of freight train, either by the stores department or by track forces for shipment to stores or other points on line for relaying, the loading rules of the Association of American Railroads should at least be complied with.

These rules, contained in pamphlet No. MD-1, "Rules Governing the Loading of Steel Products Excluding Pipe on Open Top Cars," require essentially that for loads less than 36 in. high (this height is rarely exceeded) 1-in. by 3-in. stickers be used between the car and first layers; that rails be balled in, and that three stakes of suitable material and dimension be applied on each side, extending 3 in. above the load.

On our railroad we not only require, of course, that all provisions of the AAR rules be lived up to, but that, regardless of the class of train in which flat cars either fully or partially loaded with rail are to be moved, including short moves by work train, at least four stakes, preferably five, be used on each side.

Where it is possible to do so, such as when rail is loaded for shipment to points on line by the stores department, the load is banded with high-tension steel bands regardless of height.

It is our experience that, with the type of loading used, very little shifting, if any, occurs during movement in trains. However, when shifting does occur it is most often the result of terminal switching.

Eliminate Off-Center Loads

By George S. Crites
Division Engineer (Retired),
Baltimore & Ohio, Baltimore, Md.

No "off-center" load of rail should ever be moved any considerable distance and certainly not on flat cars in revenue trains. If the rail shipment is not large enough to occupy the entire floor space of the car, it should be securely fastened to the floor in the center of the car and bulkheaded so the rails cannot shift over the ends of the car.

When a load of short-length rails is to be shipped on a flat car, the sides of the car should be fully staked and boarded to the height of the load and the ends bulk-headed to the same height. The stakes for both the sides and the ends should be shaped so as to fully fit the sockets, with added size on top to prevent their slipping through the socket and enough length below to allow for them to be spiked or pinned so that they will not work up out of their sockets.

If a sizeable load of both long and short rails is to be loaded on the same flat car, the sides should be securely staked and the long rails piled against the stakes to make a basket for the short rails in the center of the car. The ends of the car must be securely bulk-headed to prevent the rails from sliding over the ends.

Where full-length straight rails are loaded on one flat car, it is best to cross-strip the floor with a 1-in. by 3-in. hardwood strip at each end and quarter point of the rails and load one tier head up and one tier head down on these strips and continue the stripping and loading until the car is fully loaded. The sides of the car must be securely staked and the ends securely bulkheaded.

For long rails requiring two or more flat cars for loading, each car should be equipped with a secured bolster in its middle and the rails loaded head up in the centers of the bolsters to within 18 in. or 20 in. of the sides of the cars, depending upon the lengths of the cars being loaded. Cables or other secure means must be provided to hold the rails in place on the bolsters. This is particularly essential where the rails are tiered on the bolsters on strips. If the long rails are properly secured to the bolsters, there should be no occasion to bulkhead the end cars for end shifting.

Shifting or off-center loads are bad in any car on any kind of a movement and are particularly unsafe on flat cars in revenue trains.

Steel Strapping Best

By O. H. CARPENTER General Roadmaster, Union Pacific, Pocatello, Ida.

Where it is necessary or desirable to load rails on flat cars for movement in fast trains over considerable distances, or where a large amount of switching will be done with the cars, special arrangements must be made to secure the

rails on the flat cars so that they will not fall off in transit and will not be end-shifted to the extent that they will foul adjacent cars or the brake rigging on the car itself.

Where rails are being sent from one part of the division to another for re-use, we use gondolas if the rail will be unloaded by a crane. Where the rails will be unloaded by hand by dropping from the side of the car we use flat cars with not less than three hardwood or six fir or green sapling stakes on each side of the car. The car must be provided with bulkheads at the ends of the rail to prevent end-shifting. This may be done by spiking 4-in. planks to car stakes at the ends of the car. However, such a bulkhead will not stand much rough handling, and if broken down during transit becomes a hazard.

All our rails shipped on flat cars from the stores are loaded in tiers on the car with balls of the rails up, and with not less than three wood strips between the tiers. Four wood strips are also used on the deck of the car under the bottom tier-these strips being nailed to the car floor. Any scrap lumber not less than 1 in. thick and 3 in. wide is used for stripping. The best material we have found for this purpose is 2-in. scrap car flooring, which is usually ready cut to the right length and of which there is always a plentiful supply around rip tracks. The 2-in. space provides more room for insertion of bars which are employed when removing the rails from the flat car.

Instead of applying bulkheads to cars, we have, for the past several years, been using Signoid steel bands around the load of rails, three bands being applied to each load, one at about the center of the rails and one about 5 ft. from each end. This banding is made of mild steel 2 in, wide and 0.05 in, thick and has a tensile strength of 10,-600 psi. It comes in rolls and is applied by special tools which are furnished by the manufacturer under an agreement. The bands are applied at a tension of 6,400 lb. and effectively tie the load together. We have not had any cases of shifted loads when banded in this manner. The regular car stakes as specified before are used in addition to the banding. The cost of the material for banding one carload of rail is about \$2.50 and the labor cost about \$1.50 which makes a total cost of about

\$4.00 per car. Such bands also prevent the rails from shifting over against the car stakes. It is also safer to unload the rail where the bands are left in place until the stakes have been removed, since the danger of rails falling from the car while stakes are being removed is eliminated. Such accidents have occurred where rails were not banded. We do not permit ballingin of rails when loaded in tiers except in such cases where five or less rails will complete a shipment. We then permit them to be balledin near the center of the car in the top tier. We do not ship in excess of four tiers of rail on a car, thus permitting loading from 72 to 80 rails per car.

In cases of short rails being included in shipment, the longest rails are loaded at the outside nearest the stakes on each side, and the shorter rails are loaded between the longer rails.

The bands are removed from the load in the field by tapping them with a sledge hammer which easily cuts the bands around the corner of the top layer of rail.

During times of steel scarcity some attempt was made to salvage the used bands and re-use them; however this resulted in considerable trouble and expense in rolling it up and shipping to stores, in piecing it together and extra work in getting bent bands around the load. Any saving was largely overcome by the extra handling and the extra labor cost when banding the loads. We ordinarily now scrap the bands in the field.

We are not equipped to do this banding in the field, and where rail is loaded in the field for transportation over long distances in fast trains, the cars are moved to the nearest store point and banded there. Movements to store point are made in work trains or locals.

There is no doubt that this practice of banding rails is the cheapest, safest and most satisfactory way yet devised of securing rails on flat cars.

Flood Damage to Railway Buildings

What, if anything, can be done in advance of anticipated floods to minimize the damage to railway buildings? What building repairs, other than ordinary clean-up work, are usually required after floods? How and when can they be made with the best results? Explain.

Remove Damageable Fixtures

By George S. Crites Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

When an unexpected flash flood hits a railway building, there is little which can be done other than to wait for the water to run off and then clean up and repair the damage and dispose of anything which is damaged beyond repair. In such a case, if the use of the building cannot be dispensed with for some little time, temporary facilities should be provided until the build-

ing is cleaned and dried out and necessary repairs made. Usually, furniture and business machines caught in a flash flood have to be replaced.

Floods in elongated valleys usually give notice of the time of their arrival and their intensity far enough in advance to allow for some measure of protection to be taken to alleviate at least some of the flood damage to buildings.

Contents of the buildings that would be irrepairable if saturated with water and silt should be removed to places where the flood will not reach them. It is well to strip the building of all electrical appliances other than the wiring as such appliances are not trustworthy after being soaked in muddy water.

If there is time, windows and doors should be removed and taken to safe places. If this can be done, the flood waters will swish through the openings without putting too much stress upon the building proper and the deposits of mud and debris will be much less than they would be if the openings were closed. In any event, doors and windows have to be repaired and reset after a bad flood and any work done toward keeping them dry during the flood will save time and labor in the long run.

Usually, in elongated valleys, flood flow is not swift enough to

dislodge buildings, but there may be some locations in which the floods might float a building off its foundations and in such cases it is well to fasten the buildings securely to piles or heavy concrete foundations. This, of course, would be done in anticipation of future floods and not in view of a flood that was soon to hit them.

Construct Adequate Levees

Ву В. М. Микроск Engineer of Buildings, Illinois Central, Chicago

It is sometimes possible to entirely prevent flood damage to buildings when, as is generally the case with large rivers, accurate predictions of time and height of crest can be obtained. This can be accomplished by placing a sandbag levee entirely around buildings such as passenger stations. The levee should be constructed to such a height as to extend a foot or more above anticipated high water, to prevent wave action caused by passing trains from topping it. Since it is very probable that there may be no electrical current available, gasoline-oper-ated pumps should be on hand to handle seepage through the levee. Where high water is anticipated to last for some time, and where it is necessary to continue operation from the building, a standby electric power unit will prove worthwhile.

If the flood crest is expected to be above the level of the plumbing fixtures in the building, there is little that can be done in advance to protect against the flood as the levee will be of no value. In this case all movable equipment such as furniture, files, and all small electric motors should be removed from the building in advance or blocked up above high water.

Extensive building repairs are necessary even where flood waters entering the structure have remained for only a day or so, although the flood periods are usually of longer duration.

Most millwork which is touched by flood water is ruined and must be replaced. Also, wood floors will buckle badly and, while they can be repaired, in some cases, they frequently require complete renewal. Plaster has to be replaced, and the entire structure cleaned and redecorated. Finally, all sewer lines should be cleaned to insure their proper operation.



PRODUCTS OF MANUFACTURERS ...

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RUBBER INSERT FOR TIE PLATES

A RUBBER cushioned tie plate equipped with special fastening clamps and designed to prolong the life of both rail and tie and cut down roadbed noise, has been developed by the Dayton Rubber Company, Dayton, Ohio. The rubber inserts are made of a combination of synthetic and natural compounds and toughened to withstand severe pounding and extreme weather conditions. They also are



said to be oil and creosote resistant. The two sections of the assembly consist of an adapted standard tie plate and cast-steel clamps. The rail is cushioned directly on rubber instead of the plate. The manufacturer claims that, in addition to its other advantages, the cushioned plate reduces rail creepage to the point where rail anchors are not needed, prevents rail damage due to careless spiking since the spike heads are kept away from the base of the rail, and increases the effective shank length of spikes, thus providing better rail anchorage.

NEW BLADE FOR PNEUMATIC SAW

THE WRIGHT Power Saw & Tool Corp., Stratford, Conn., has announced the new "Sabre" blade, designed for use with the Wright



The Wright "Sabre" pneumatic saw blade

pneumatic saw. The Sabre blade is said to be semi-self-sharpening and no special saw filing skill is required due to a new tooth design. Sharpening of the ½ in. wide blade is accomplished by filing straight across the face of the teeth and no gauges are required. Faster cutting speed, improved ripping and angled cutting are pointed out as characteristics of the new Sabre blade.

ELECTRIC CHAIN SAW

A NEW electric chain saw has recently been announced by the Skil Corporation, Chicago. The new Model 125 is designed for heavy lumber and timber cutting up to 14 in. on one cut. An exclusive feature of the new Skil electric chain saw is a push-button oiler that lubricates the chain while in operation. The chain is a chrome plated, chipper-type that travels at 1400 ft. per min. for cutting of heavy construction beams and felling, bucking, trimming and limbing of small and medium-sized timber.



The Skil Model 125 electric chain saw

Weighing 16½ lb., the Skil chain saw is equipped with a spade-type rear handle and wrap-around universal handle said to make handling easy in any position on any cut. Other features include lightweight aluminum alloy housing, ball and needle bearings, safety trigger switch and steel helical gears. Standard voltage is 115. The saw is available on special order for 220 volts at no extra cost and runs off a 1500-watt generator.

For additional information on any of the products described on this page, use postcards, page 759.

"THAT ONE DAY ...

... "WHICH I SPENT RIDING YOUR SPRAY TRAIN SURE WAS AN EYE-OPENER FOR ME!"

"LIKE many another engineer, I thought in terms of doing my own spraying, when I started to use weed killer some years ago, and we did our own spraying for a period of years. But, when I rode your train, studied your spray car design, and observed your accomplishment in one working day, I realized that your business is very highly specialized. In my opinion, no railroad can hope to duplicate this accomplishment on a self-service program. A railroad is not geared up to concentrate on this one job, as your organization is. From now on, I want READE spraying service as well as READE chemical."

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THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

Changes in Railway Personnel

General

E. C. Shreve, chief engineer of the Western Maryland, has been appointed assistant to the president with headquarters, as before, at Baltimore, Md.

Engineering

J. A. Barnes has been appointed division engineer of the Dakota division of the Chicago & North Western with headquarters at Huron, S. D., succeeding R. D. Culbertson who has been transferred to the Madison division at Madison, Wis. Mr. Culbertson succeeds M. S. Reid, who has been transferred to the Galena division with headquarters at Chicago.

C. C. Kidd, assistant engineer on the Chesapeake & Ohio, has been promoted to assistant bridge engineer, with headquarters, as before, at Richmond, Va. Thomas J. Reagan has been appointed construction engineer in charge of all grading and track work in connection with the Dunellen, N. J. grade elimination project on the Central of New Jersey. Earl J. Shelley, supervisor of track at Jersey City, N. J., has been promoted to assistant engineer at that location.

Vernon R. Copp, resident engineer on the St. Louis-San Francisco, has been promoted to the newly created position of construction engineer with headquarters, as before, at St. Louis, Mo.

John F. Kerwin, assistant engineer of design on the Boston & Maine, has been promoted to engineer of design succeeding John P. Cronin, who has retired after 41 years of service. James J. Winn, assistant division engineer of the Terminal division, has been promoted to division engineer of the Portland division with headquarters at Dover, N. H., succeeding Harold F. Tupper, deceased. Thomas K. Dyer, assistant structural engineer, has been appointed assistant division engineer of the Terminal division at Boston succeeding Mr. Winn. Everett A. Armington, assistant engineer has been appointed assistant structural engineer to succeed Mr. Dyer.

T. F. Maloney, Jr., supervisor of track on the New York Central at Wellsboro Junction, Pa., has been appointed assistant division engineer on the electric division with headquarters at New York, succeeding J. E. Spangler, who has been promoted to division engineer of the Mohawk division at Albany, N. Y. Mr. Spangler succeeds W. J. Kernan who has been promoted to assistant engineer, maintenance of way, Line East and Boston & Albany Railroad, with headquarters at Syracuse, N. Y.

Robert R. Pregnall, Jr., assistant engineer maintenance of way of the Northem division of the Atlantic Coast Line at Rocky Mount, N. C., has been promoted to engineer maintenance of way of that division at Savannah, Ga., to succeed F. L. Etchison, whose appointment as chief engineer of the Western Maryland is noted elsewhere in these columns. A. C. Low, Jr., roadmaster at Wilmington, N. C., has been advanced to assistant engineer maintenance of way at Rocky Mount to replace Mr. Pregnall.

Mr. Pregnall is a native of Charleston, S. C., and was graduated from The Citadel with a B.S. degree in Civil Engineering in 1939. He entered the service of the



Robert R. Pregnall

Coast Line as an instrumentman on May 1, 1946, at Savannah, where he subsequently held the positions of junior engineer, assistant engineer and senior engineer. In April 1949 he was appointed division engineer at Rocky Mount. Named roadmaster in February 1951, Mr. Pregnall served in that capacity, consecutively, at Tarboro, N. C., and Albany, Ga. He was appointed assistant engineer maintenance of way at Rocky Mount in

F. L. Etchison, engineer maintenance of way of the Northern division of the Atlantic Coast Line with headquarters as Savannah, Ga., has been appointed chief engineer of the Western Maryland at Baltimore, Md., to succeed E. C. Shreve, whose appointment as assistant to president is announced elsewhere in these columns.

A number of additional changes in the maintenance-of-way department of the New York Central System have been announced by John P. Hiltz, Jr., chief engineer, maintenance of way, as follows:

Ralph R. Smith, assistant engineer, maintenance of way, Line West, Cleveland, Ohio to assistant chief engineer, maintenance of way, New York; Anthony J. Flanagan, assistant engineer, New York, to office engineer; William J. Kernan, division engineer, Albany, N. Y., to assistant engineer, maintenance of way, Lines East, at Syracuse, N. Y.; Kenneth E. Dunn, division engineer—special duty, New York, to industrial engineer; and William Hayduk, assistant supervisor, bridges and buildings, to bridge and building engineer, New York.

A management services group has been established in the maintenance-of-way department. Thomas F. McCabe, office assistant to the chief engineer, maintenance of way, has been promoted to chief of management services; William J. Hag-





Portable Conveyor and a B-G Car Unloader unloaded a car of coal in



garty, traveling storekeeper, becomes supervisor of inventory control; Harry L. Buhler, chief clerk in the maintenance-of-way department at New York, becomes supervisor of personnel; and William E. Heinchon, maintenance-of-way accountant at New York, has been appointed supervisor of budget and statistics.

Chester J. Henry, assistant chief engineer of the Eastern region of the Pennsylvania, has been promoted to chief enginer succeeding L. P. Struble, who retired July 1 after nearly 44 years of service. John E. South, engineer of bridges and buildings on the Eastern region at Philadelphia, has been promoted to assistant chief engineer succeeding Mr. Henry. William G. Kemmerer, assistant engineer of bridges and buildings, has been promoted to engineer bridges and building succeeding Mr. South. Joseph A. Jorlett, assistant engineer, has been promoted to assistant engineer of bridges and buildings succeeding Mr. Kemmerer. John B. Smythe has been appointed assistant engineer to succeed Mr. Jorlett.

Mr. Struble was born November 22, 1886, at Branchville, N. J., and graduated



L. P. Struble

from Lehigh University in 1909. He entered railroad service in November of the latter year with the PRR and served successively in the chief engineer's department at Pittsburgh as draftsman, transitman, engineer in charge, chief draftsman, assistant engineer and assistant to the chief engineer, until April 1929. He subsequently served as engineer in charge of construction at Newark, N. J. until April 1938 when he was promoted to assistant to chief engineer of the Central region. In April 1942 he was named chief engineer of the Eastern region, the position he held until his recent retirement.

Mr. Henry was born December 1, 1900, at Youngsville, Pa., and received his higher education at the University of Cincinnati. He entered railroad service July 8, 1918, as a trackman on the PRR at Cincinnati, Ohio, and in September 1920 became a rodman on the Baltimore & Ohio at Flora, Ill. In September 1921 he joined the Cleveland, Cincinnati, Chicago & St. Louis as a rodman at Springfield, Ohio, and in June 1923 entered the service of the Pennsylvania as an assistant on the engineering corps at Erie, Pa.

From 1926 until 1929 he served as assistant supervisor at Long Island City, N. Y., and Wooster, Ohio, and in the latter year was promoted to supervisor at Titusville, Pa., In 1930 he was transferred to Niles, Ohio, and in 1931 to Trafford, Pa. After serving as supervisor at Philadelphia, Pa., he was named division engineer at Buffalo, N. Y., in 1934. In 1937 he was transferred to Pittsburgh and in 1932 was



Chester J. Henry

promoted to superintendent at Toledo, Ohio. From 1943 until 1944' he served as superintendent of freight transportation at Philadelphia and in 1945 was named superintendent of the Maryland division at Baltimore, Md. He was promoted to assistant chief engineer of the Eastern region in 1947—the position he held at the time of his recent promotion.

Mr. South was born June 27, 1900, at Pittsburgh, Pa. and graduated from the University of Pittsburgh in 1924. He entered railroad service in the office of the engineer of bridges and buildings of the PRR in Pittsburgh in 1924, and the following year was transferred to the same department at Philadelphia. He successions



John E. South

sively held the positions of supervising draftsman, office engineer, and assistant engineer of bridges until February 1, 1947, when he was named engineer of bridges—the position he held until his recent promotion.

(Continued on next page)



NEW Ramset PLUS-POWER JOBMASTER

Ask your local Ramset Dealer or mail the coupon for details about Ramset's newest powder-actuated tool for steel and concrete fastening. Does many heavy-duty jobs at light-duty cost. Saves ½ cost of heavy-duty powder loads. Ask also about new Tru-Set Flat Head Drive Pins, especially designed for PLUS-POWER JOBMASTER, for additional economy on many jobs.

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Where do you need grease lubricators but haven't installed them because of cost? Here is a well-proved answer to your problem!

For example, one road found 29 spots to use the Aladdin in a single terminal yard. Others are using them on short curves and other in-between points of wear. And still others are using them on main lines where diesels are causing unexpected wear.

How it works: It's hard to believe that such a simple device performs so efficiently. The Aladdin is a self-contained valveless pump. There are no external parts. It works by reason of inertia and vibration forces developed by wave motion of the rail. A passing wheel shakes the lubricator and feeds it grease—as simple as that! It will work at any speed from 5 mph upwards. Grease flow is adjustable, and "carry" is ¾ of a mile or more.

No Maintenance: The only moving part in the Aladdin is a spring-loaded piston which moves at the rate of only 7 inches a week! If the Aladdin goes dry accidentally, no harm is done, because no part of the lubricator is touched by passing wheels. Thus there is no maintenance at all—except to fill it!

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Proved: Thousands of Aladdins are in use all over the world on main lines...in yards...under one or two-way traffic...in climates from 120 in the shade to 20 below. For further information, write for Bulletin C.

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Railway Personnel (Cont'd)

Mr. Kemmerer was born August 23, 1889, at Camden, N. J., and graduated from Purdue University in 1912. He was employed by the Scoffield Engineering Company, Philadelphia, until 1913 when he entered the service of the PRR where he held successively the positions of draftsman, rodman, and transitman until 1917. In 1917 until 1923 he served as an assistant supervisor, assistant master carpenter, and bridge inspector and in the latter year was appointed supervisor of bridges and buildings. After serving as master carpenter, Mr. Kemmerer was pro-



William G. Kemmerer

moted to assistant engineer at Chicago in 1929. In 1945 he was promoted to assistant engineer of bridges and buildings, the position he held at the time of his recent promotion.

Track

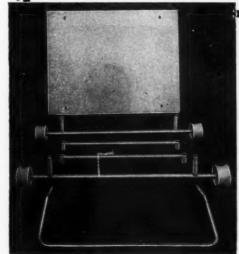
C. L. Anderson, acting supervisor of track on the Syracuse division of the New York Central at Syracuse, N. Y., has been appointed to that position.

P. K. Cruckshank, assistant engineer in the division engineer's office of the New York Central at Boston, Mass., has been promoted to assistant supervisor of track on the St. Lawrence division at Ramsen, N. Y.

W. E. Carlson, has been appointed roadmaster on the Northern Pacific at Centralia, Wash. succeeding L. L. Norquist, who has been transferred to Lester, Wash., succeeding G. J. Kavadias, deceased.

Anthony DiSpirito has been apopinted acting assistant supervisor of track on the Central of New Jersey at Long Branch, N. J. succeeding Martin A. Golden who has been transferred to Allentown, Pa. Mr. Golden succeeds Joseph P. Leahy, who has been promoted to supervisor of track at Ashley, Pa. Mr. Leahy succeeds Gabriel Gyenes, who has been transferred to Somerville, N. J. Mr. Gyenes succeeds John J. Kozzi, who has been transferred to Jersey City, N. J., succeeding Earl F. Shelley, whose promotion to assistant en(Continued on page 762)





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Railway Personnel (Cont'd)

gineer at Jersey City is noted elsewhere in these columns.

Peter DiPaola, supervisor of track at the Chicago division of the Pennsylvania has been transferred to the Columbus division succeeding C. L. McElheny, who has been transferred to the Chicago division with headquarters at North Judson, Ind. L. D. Freeman, supervisor of track at the Northern division has been transferred to the Columbus division succeeding W. H. Lindsay, and W. J. Yahn, supervisor of track at the Eastern division has been transferred to the Cincinnati division, succeeding C. W. Owens. D. R.

Wolfe, supervisor of track on the Susquehanna division, has been transferred to the Fort Wayne division succeeding W. E. Hiltebeitel. W. B. Newell, assistant supervisor of track at the Middle division has been promoted to superivsor of track on the Fort Wayne division, succeeding J. E. Radcliffe. J. S. Fluke, assistant supervisor of track on the Pittsburgh division, has been promoted to su-pervisor of track on the Columbus Division succeeding H. F. Long. C. M. Edwards, assistant supervisor of track on the Philadelphia Terminal division, has been promoted to supervisor of track on the Fort Wayne division with headquarters at Grand Rapids, Mich. succeeding G. W. Gangluff, who has been transferred to the Fort Wayne division with headquarters at Fort Wayne, Ind., succeeding M. K. Clark. J. F. Youngstrom, junior engineer on the Columbus division, has been promoted to assistant supervisor of track on that division succeeding G. E. Ellis.

Bridge and Building

Claude C. Sims, supervisor of bridges and buildings on the Chesapeake & Ohio at Hinton, W. Va., has retired after 35 vears of service.

A. C. Price, bridge and building master on the Toronto Terminals division of the Canadian Pacific at Toronto, Ont., has been transferred to the London division at London, Ont., to succeed H. P. Creighton, who has retired after 47 years of service. J. H. Creighton, who has served in the division engineer's office and engineering branch of the operating department at London, has been promoted to bridge and building master to replace Mr. Price.

Obituary

Isaac W. Geer, retired chief engineer of the Western region of the Pennsylvania, died recently at his home in Chi-

James B. Akers, chief engineer of the Southern, died July 8.

Mr. Akers was born March 16, 1884, at Danville, Va., and received his higher education from Washington and Lee University. Mr. Akers entered railroad service in 1904 as an assistant supervisor on the Ashville division of the Southern, and the following year was promoted to levelman.



James B. Akers

He was promoted to transitman in 1906 and in 1907 was named assistant engineer. From 1911 to 1921 he served as engineer maintenance of way of the Middle district and in the latter year was promoted to chief engineer, maintenance of way and structures, Lines East. From 1924 to 1931, Mr. Akers was assistant to the vice-president of engineering and maintenance of way, and in the latter year was appointed assistant chief engineer. He was promoted to chief engineer (Continued on page 764)

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Now one machine does all these jobs

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Railway Personnel (Cont'd)

in February 1946. Mr. Akers served as president of the American Railway Engineering Association in 1946-1947.

Association News

Mississippi Valley Maintenance of Way Club

At the close of its first year of existence this club has issued a yearbook to its members which indicates that the organization is firmly established as a medium for the discussion of maintenance of way problems in the St. Louis area. During (Continued on page 766)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association
—Annual Meeting, March 16-18, 1954, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association— W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

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CLA

Bridge and Building Supply Association
—L. R. Gurley, Secretary, 201 North Wells
street, Chicago 6.

Maintenance of Way Club of Chicago— E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club-Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive Street, St. Louis 1, Mo.

National Railway Appliances Association— J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, October 14-16, 1953, Biltmore Hotel, Atlanta, Ga. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

ANEW BANTAM! GRAWLER ... JUST LOOK WHAT YOU GET!

and it sells for only

F.O.B. FACTORY—BASIC CRAWLER WITH 1400 LB. COUNTERWEIGHT, LESS ATTACHMENT Price Subject to Change

Model

5 TON — 3/8 CU. YD.

BACK HOE SHOVEL

CLAMSHELL BACKFILLER

MAGNET CRANE

CRANE

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lable with 9 fast-change attachments:

GRAPPLE DRAGLINE PILE DRIVER

2-SPEED INDEPENDENT TRAVEL

Enables the operator to move at varying speeds, forward or reverse, while operating the front end attachment.

LOW GROUND BEARING PRESSURE

2 pad sizes available. 5 lbs. per sq. in. with 16" pads—31/3 lbs. per sq. in. with 24" pads.

BIG MACHINE STABILITY

Longer, wider tracks — and a low center of gravity gives greater lifting capacity.

HIGH SPEED OPERATION

Features immediate acting straight mechanical controls, easy positive braking action, fast line and swing speeds.

🗷 FAMOUS BANTAM FEATURES

Power boom hoist, machine cut gears, anti-friction bearings, 4 hook rollers, greater visibility.

■ 94-INCH OVER-ALL WIDTH

Minnill

Allows the Bantam to be moved from job to job on standard trailers without special highway permits.

OVER 4,500 satisfied Bantam customers all over the world tell the story better than we can! Building one

size machine and making it a top quality rig has been Schield Bantam's contribution to Shovel-Crane Industry. Bantam's specialization and mass production of this 3/8 cu. yd. machine has meant higher quality at the lowest cost in the industry! The idea of the all-purpose 3/8 cu. yd. power shovel-crane has long since found wide acceptance. NOW . . . you, too, can receive the rewards from this great American idea by letting Schield Bantam solve your lifting and excavating prob-lems! Whether your work calls for a crawler

or a truck mounted crane-excavator, the BAN-TAM can do your job faster . . . better . . . cheaper! Write today for further information on the BANTAM for your jobs! Schield Bantam Co. 284 Park St., Waverly, Ia.

THIS, TOO, IS ALL NEW!

Model

T-35

6 TON

A RRAND NEW CRANE CARRIER CUSTOM BUILT BY A FAMOUS TRUCK MANUFACTURER

ANOTHER NEW PRODUCT OF THE

WORLD'S LARGEST PRODUCERS OF TRUCK-

Your Schield Bantam Distributor is Scheduling On-The-Job Demonstrations Right Now... See Him Today!

TO COMBAT CORROSION

Specify

TAPECOAT

...the Original Coal Tar
Tape Protection for Pipe,
Pipe Joints, Couplings
and Tanks



TAPECOAT is a coal tar coating with a tar-saturated, close-woven fabric as a carrier for easy application, providing a *natural* protection against corrosion.

TAPECOAT serves as both bond and protection...requires no foreign adhesive.

TAPECOAT resists moisture, acids, alkalis, soil stress, electrolysis, chemical fumes, fly ash, salt water, salt-laden air, barnacles and other severe corrosive and abrasive conditions.

TAPECOAT is clean to handle and easy to apply by spiral or "cigarette" wrapping with the use of a torch to bleed the coating for a bond to the surface. It cuts maintenance and replacement costs.

SIZED TO THE JOB

TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths to meet varying requirements.

TAPECOAT has proved its dependability for gas and oil companies, railroads, telephone companies, air lines, ship builders and operators, water and sewage works, chemical and industrial plants, engineers and contracters ... in combating corrosion both underground and above around.



Write for descriptive brochure and prices

The TAPECOAT Company

Originators of Coal Tar Tape Protection

1541 Lyons Street, Evanston, Illinois

Association News (Cont'd)

the 1952-53 season the club held six regular meetings in addition to the organizational meeting on October 27, 1952. According to the yearbook it wound up the season with a total membership of 509 railway men and representatives of supply companies. After all expenses were paid the club had a bank balance of \$710 as of May 1.

Material given in the yearbook includes a listing of the officers and standing committees, the annual report of the secretary-treasurer, a record of the meetings held during the first season, the constitution, and a directory of the members, both alphabetically and broken down by companies.

Bridge and Building Association

Final details of the program for the coming convention, to be held on September 15-17 at the Conrad Hilton Hotel (Stevens), Chicago, were worked out at a meeting of the Executive committee at the Engineers' Club, Chicago on July 10. At this same meeting copies of all the reports of the seven subjects committees were available and were read and approved for presentation at the convention. The timely subjects dealt with by these reports, plus the fact that a record exhibit of manufacturer's products will be on display at the Coliseum during the meeting, indicates that this convention should be one of the most successful ever held by the association. The meeting of the Executive committee was held under the direction of President Foster R. Spofford, assistant to chief engineer, Boston & Maine.

Roadmasters' Association

A meeting of the Executive committee was held at the Chicago Engineers' Club on July 13 to complete plans for the annual convention to be held on September 15-17 at the Conrad Hilton Hotel (Stevens), Chicago. With President R. H. Gilkey presiding the Executive committee not only discussed the convention program in detail, but also reviewed and approved those reports of the subjects committees that were not considered at the last previous meeting. Every indication is that the convention as a whole will rank as one of the most successful that the association has held. The fact that an unusually large display of manufacturers' products will be on exhibit at the Coliseum will do much to assure its success.

Supply Trade News

General

The Nelson Stud Welding Division of Gregory Industries, Inc., Lorain, Ohio, has announced the establishment of three new direct factory branch warehouses at Atlanta, Ga., St. Louis, Mo., and Denver, Colo. All will stock studs, parts and accessories and will have Nelson stud weld-

ing guns, Nelwelder generators and battery units available for either purchase or rental.

The Orton Crane & Shovel Co., Chicago, has announced the appointment of Industrial Handling Associates, Cleveland, Ohio, as representatives for the Cleveland area. Charles F. Yarham and Clem Reik of Industrial Handling Associates will handle Orton products and the products of a number of other manufacturers of materials handling equipment in the railroad field.

The DeVilbiss Mfg. Co., Ltd., Canadian subsidiary of the DeVilbiss Company, Toledo, Ohio, will shift manufacturing operations from Windsor, Ont. to a new \$600,000 modern plant at Barrie, Ont. about December 1. The move will give the company increased manufacturing facilities with the new plant covering 63,800 sq. ft. as compared to 42,000 sq. ft. in the two plants located at Windsor. It will also provide for consolidation of manufacturing and general offices in one building.

Reorganization of the domestic sales territories of the LeTourneau-Westinghouse Company, Peoria, Ill., into Eastern and Western divisions instead of Eastern, Central and Western division as heretofore established, has been announced. J. A. Vincent continues as Eastern division sales manager, and F. W. Duke, former district sales representative for the company, has been appointed Western division sales manager.

The line separating the territories divides the province of Ontario, follows the eastern shore of Lake Michigan, the southern boundary of Wisconsin, the eastern boundary of Iowa, and extends west along that state's southern boundary. From thence it continues down the center of Missouri to its southern boundary, extending west to Oklahoma, and then following the eastern boundaries of Oklahoma and Texas southward to the Gulf of Mexico.

Personal

Douglas Grymes, Jr., manager of railroad sales for the Wood Preserving Division of the Koppers Company, Inc., has been appointed to the new consolidated post of sales manager of the Wood Preserving Division. As head of the new department, Mr. Grymes will have responsibility for both railroad and commercial sales of the division. J. M. Irvine, manager of commercial sales, has been named to the new staff position of project manager and Robert H. Devine, assistant manager of railroad sales, has been named assistant to the manager of the consolidated sales department with continued responsibilities in railroad sales work.

Robert L. Holman has been appointed salesman for the Railroad Division of the Wm. H. Zeigler Co., Inc., with headquarters at Minnapeolis, Minn. Mr. Holman will call on transcontinental railroads which headquarter in the Twin Cities. (Please turn to page 768)

JUMPS AHEAD OF COMPETI

Yes, the Universal Frog for yard service is built better 4 ways . .

It is made of an alloy electric cast steel that adapts itself to low cost electric or oxy; acetylene welding in track or shop.

Tie plates are cast integral with the Universal Frog-an exclusive!

Rail supports are cast integral on both ends of the Universal Frog -another exclusive!

One-piece/construction - no loose joints. Eliminates extra par and cuts down maintenance costs

Tuning Chunnil

HERE'S PROOF: Compare the cross sections of the Universal Frog with conventional types. Note the improved type rail joints, the patented supporting shelf, integral tie plates and rib construction.

36" RIB IN CENTERS OF

ALL INTEGRAL TIE PLATES

Supply Trade News (Cont'd)

W. J. McIntosh, regional highway engineer for the Portland Cement Association, Chicago, has been appointed district engineer in charge of the New York office, succeeding John F. Hall, who has resigned.

L. C. Dobbrow and J. T. Miller have been appointed sales and service representatives for maintenance specialties produced for the railroads by the Pennsylvania Salt Manufacturing Company. Mr. Dobbrow will handle railroad accounts in Pennsylvania, New Jersey and Delaware, whil: Mr. Miller will handle accounts in New York state. George W. Morrow has joined the Ramapo Ajax Division, American Brake Shoe Company, as sales engineer. Mr. Morrow has a long record of service with railroads and supply companies, and has represented such firms as Pullman-Standard Car Manufacturing Company, the Ingersoll-Rand Company, Reade Manufacturing Company and the Worthington Corporation. He will be located at Chicago.

G. M. Dewart, Chicago office salesman for the Wood Preserving Division of Koppers Company, Inc., has been promoted to district sales manager of the Denver (Colo.) district. S. S. Curtis, assistant to the district manager of the Texarkana district, has been promoted to manager succeeding C. F. Seyer, Jr., who has been appointed manager of the Division's Chicago district. Mr. Seyer succeeds R. P. Jackson, who has been promoted to executive assistant to the vice president of the Western region.

R. G. Angell has been appointed manager of sales for the A. M. Byers Company, with headquarters at Phialdelphia, Pa.

A graduate of Ohio University, Mr. Angell joined the A. M. Byers organization in 1934 and has served as field service



R. G. Angell

engineer and railroad representative with the company's Philadelphia and New York offices since 1935. Prior to 1934 Mr. Angell served with the Missouri State Highway Department and the American Bridge Co.

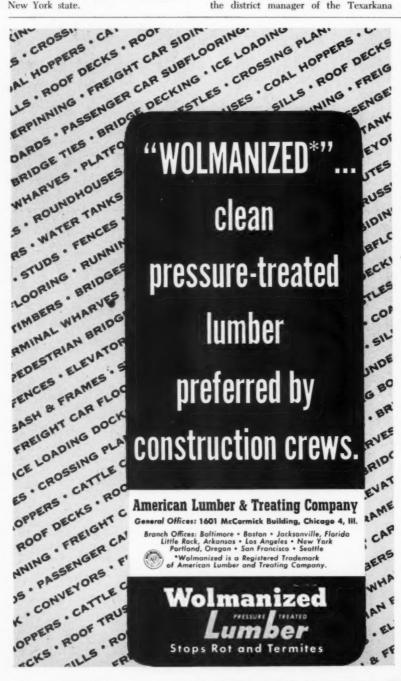
E. J. Byrnes, Jr., has been appointed assistant general manager of sales of the Eastern Division of the Colorado Fuel and Iron Corp., New York.

Mr. Byrnes joined the Wickwire Spencer Steel Company, prior to its merger



E. J. Byrnes

with the CF&I as an administrative assistant in the Springs and Formed Wire Department at New York, in June 1925. He was promoted to assistant product manager of that department in 1938 and in 1940 was appointed product sales man(Continued on page 770)



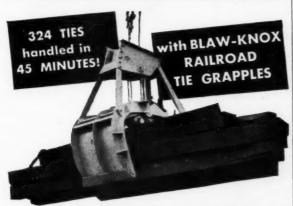
TRACK ACCESSORIES

JOINT BARS
ANGLE BARS
ANGLE BARS for OLD RAILS
PLAIN SPLICE BARS
TRACK SPIKES

Manufactured by

TREDEGAR COMPANY

RICHMOND II, VIRGINIA



HERE'S the fast, efficient tool you need to cut handling costs for any job of loading or unloading railroad ties. Check these Blaw-Knox features before you buy any grapple . . .

- Low grapple height (low headroom) permits maximum crane reach.
- Safe operation when handling creosoted tles from high side gondola cars.
- All welded construction permits maximum handling capacity for a crane of given size, without sacrificing strength.
- Efficient design allows deep penetration for a full land.
- Fast, safe crane operation results from firm gripping of the ties.
 WRITE FOR BULLETIN 2404



BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
Of Farmers Bank Bldg. Pittsburgh 22, Pa
Offices in Principal Cities



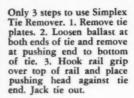
with SIMPLEX

on **Every** Railroad Jacking Job...



It requires only half the time to take out old ties with the new Simplex Tie Remover and insert new ones with the new Simplex Tie Replacer. Easy jacking action eliminates danger of pick and tie tongs methods. Saves work with only 1/4 as much ballast handled as with hand tie renewal. No. 80 Tie Remover: 801/2" travel, 62 lbs. No. 82 Tie Replacer: 86" travel, 60 lbs.





TIE REPLACER

Simplex Tie Replacer works quickly, easily. Start new tie under first rail in space left by old tie. Hook rack bar over rail and place pushing head against end of tie. Jack tie into place.



SIMPLEY AS TRACK JACK

Features aluminum alloy housing — weighs only 28 lbs. 2½" x 3½" forged toe and 5" lift. Ideal for surfacing, lining, with power tampers.

- **Aluminum Alloy Track**
- Jacks Malleable Track Jacks Rail Puller and Expander
- **G-Y Tie Spacer** Tie Remover
- Tie Replacer
- **Bridge Jacks** Jack Supports
- Push and Pull Jacks Journal Jacks
- Ratchet Lowering Lever Jacks Geared Jacks
- Traversing Base Screw Jacks
- **Car Siding Jack** Trailer Supporting Jack
- Pole Pulling and Straightening Jacks

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RAILROAD

JACKS FOR ALL DEPARTMENTS

- Reel or Drum Jacks
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- Simplex Center-Hole Hydraulic Jennies Simplex Hydraulic Jacks

For full information on Simplex Railroad Jacks, write for NEW Bulletin: RR53

TEMPLETON, KENLY & COMPANY

2543 GARDNER ROAD BROADVIEW, ILL.

Supply Trade News (Cont'd)

ager. Mr. Byrnes will make his headquarters in New York.

G. R. Betts, manager of railroad sales for Armco Drainage & Metal Products, Inc., Middletown, Ohio, has been promoted to sales manager of the O'Neall division of that company. Herbert Clark, Jr., sales engineer in the railroad sales department, has been promoted to manager of railroad sales to succeed Mr.

Upon graduation from the Carnegie Institute of Technology, Mr. Betts joined Armco in 1922 at Middletown. He entered sales work in 1924 and in 1931 was transferred to the Lyle Culvert and Pipe Company, an Armco subsidiary. In 1940 he was appointed Minneapolis sales representative for the Armco Railroad Sales



G. R. Betts

Company and in 1944 was transferred to the Chicago office. In 1945 he was appointed to the position of manager of railroad sales which is the position he held until his recent appointment.

Obituary

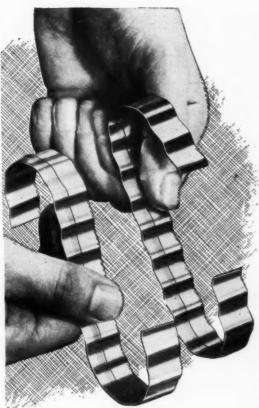
Frank J. Cullen, president of the Cullen-Friestedt Company, Chicago, died at his home in Oak Park, Ill. (Chicago), on June 22 after a long illness.

Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 759).

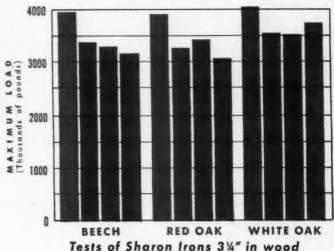
Crawler Tractors—The Allis-Chalmers Manufacturing Company has recently published a new catalog which shows details of construction of each of the four diesel-powered Allis-Chalmers' crawler tractors. The booklet contains full cutaway pictures, presented in a unique manner. As the pages of the catalog are turned, a spread of the cross-sectional view, is found for each model. When completely opened, the four tractors in cross section are in view. A complete list of job applications for each type of tractor is also presented.

(Please turn to page 772)



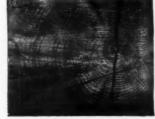
New tests prove SUPERIOR HOLDING POWER of Sharon Irons

Test data approved for release by PITTSBURGH TESTING LABORATORY



Why you can depend on full holding power of Sharon irons

Here is a typical checked fie. Note off-center position of the split. If an alternate holding device were centered in this timber, it would have an effective depth from the split of only 1½ inches; and effective holding power would be only 1800 pounds*.



*Holding power of alternate device at various depths:

_	
r of alte	rnate device at vo
1/2"	390 pounds
1//	1030 pounds
11/2"	1800 pounds
2"	2550 pounds
21/2"	2920 pounds
3"	3090 pounds
31/2"	3575 pounds



If Sharon irons had been installed in this tie, they would have been driven at the heart of the timber, thus would have exerted maximum holding power to prevent splitting. (Based on test data, holding power approximately 3541 pounds.)

TESTS, proving the high holding power of Sharon antichecking irons, were made by driving various types of 5" Sharon irons into test timbers, approximately 3-¼" deep. The exposed end of each iron was then gripped by a testing machine and pulled until the wood began to plug and finally until maximum loading was reached. The average maximum load carried by Sharon irons, of C and S types, crinkled and plain, in different types of wood, was 3541 pounds.

You can obtain this superior holding power of Sharon irons and provide insurance against splitting of ties at surprisingly low cost. Railroad figures show installed cost of Sharon irons is about seven cents per main line tie . . . approximately 1/4 the cost of alternate methods.

Call Brainard now for complete information



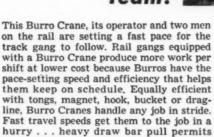
SHARON STEEL CORPORATION

For booklet and/or samples, write Brainard Steel Division, Dept. HH-8, Griswold Street, Warren, Ohio.

WARREN, OHIO

3 MEN and a BURRO...

A Real Production Team!





Only Burro Cranes Have:

- Fast travel speeds . . . up to 22 MPH
- Draw Bar Pull of 7500 lbs. often eliminates need for work train or locomotive
- Elevated Boom Heels for working over high sided gondolas
- Short tail swing will not foul adjoining track
- Low overall height a Burro can be worked and loaded on a standard flat car

Write for Bulletins on Burro Cranes



hauling work train and gang.

CULLEN-FRIESTEDT CO.

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SPEED RAIL MAINTENANCE at reduced costs



RTW Model P-43 Power Track Drill with Outrigger Attachment

The RTW Model P-43 Power Track Drill embodies many features that speed rail maintenance at materially reduced costs.

- Powered by a $1\frac{1}{2}$ h.p. air cooled gasoline engine with a V-belt which acts as an overload release when the drill bit sticks. Quick and ample adjustments assure perfect alignment when drilling.
- Thirteen inch telescopic extension in rail head bracket facilitates drilling holes around switches, rails and rail guards.
- \bullet Chuck jaws accommodate $1\,^{1\!/2}$ inch flat beaded bits and remain open when changing bits.
- Quickly detached from outrigger for off-track use. Knurled leveling device between outrigger handles compensates for various weights of rail.

Write us for further details

Railway Track work Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.
Rall Grinders . Switch Grinders . Cross Grinders . Surface Grinders . Rall Drills
Ballast Extruders . Bit Sharpeners . Tie Nippers . Grinding Wheels . Cut-Off Wheels

Trade Publications (Cont'd)

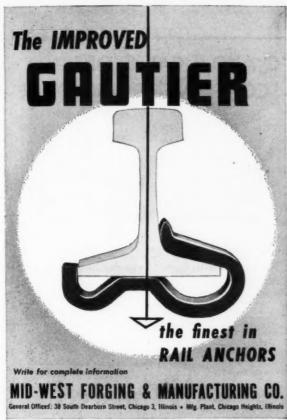
Loaders—The Tractomotive Corporation has recently released a new 6-page folder describing its TL-10 Tracto-Loader. The 2-color folder contains onthe-job action photographs of the device, together with complete constructional and operational specifications.

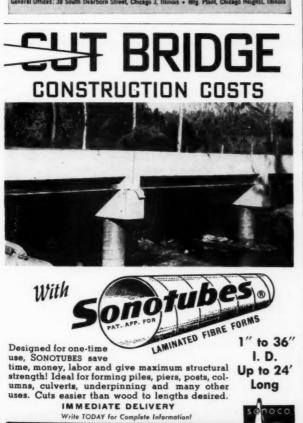
Fire Pumps—The Ingersoll-Rand Company has made available a 4-page descriptive bulletin, designated Form 7226, dealing with its line of horizontal single-stage and vertical, multi-stage fire pumps. The two-color booklet contains cross-sectional views with additional descriptions of the design, construction, and performance of the pumps.

Power Tools—The Syntron Company has recently released a new catalog, identified as Catalog No. 537, illustrating and describing its complete line of portable power tools. Contained in the 30-page booklet are descriptive information and specifications on Syntron electromagnetic hammers and hammer drills, and the firm's complete line of portable electric drills, screwdrivers, nut runners, polishers, sanders, and grinders. Information on the new Syntron electric impact wrench is also included. The 2-color booklet also contains information on Syntron gasoline hammer paving breakers and rock drills, together with concrete vibrators of both the form and flexible shaft mass type.

Materials Handling-New methods in bulk and package materials handling are pictorially described in a new 12-page "Modern Materials Handling" booklet recently published by the Tractor division of the Allis-Chalmers Manufacturing Co. The two-color booklet contains action shots of crawler and industrial wheel tractors, motor graders, and power units, plus detailed views of the rubber-tired bulk moving equipment recently added to the Allis-Chalmers line. The photographs show handling of mail and other freight in rail yards; log-hauling from forest to mill; stockpiling cut lumber; coal stockpiling; and many other important industrial material handling jobs. Capacity, horsepower, weight and other basic data on Allis-Chalmers equipment and necessary attachments is included.

Cement—The Corrosion Engineering Department of the Pennsylvania Salt Manufacturing Company has prepared a comprehensive chart showing the resistance of seven classes of Pennsalt corrosion-resistant cements to 297 of the most generally used corrosive chemicals. The cement mortars listed in the chart are: Penchlor; Pennsalt Furan; Pennsalt Asplit; Pennsalt HF; and Pennsalt PRF; Pennsalt Sulfur; and Pennsalt Carbon Sulfur. Pennsalt corrosion engineers point out that the new chart is intended only as a guide for engineers, construction and maintenance men, and purchasing agents in selecting chemical resistant cements to meet their particular problems. Because of the variety of conditions and constructions under which the chemicals listed are used, final selection should be based on an analysis of the problem by corrosion engineers of the cement manufacturer.







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DISTRIBUTORS WANTED - Write for details!



Here's the answer wherever economy in light earth-moving operations is essential! The new High Lift Hydraulic "Agricat" gives low-cost, low-maintenance loading... plus superior performance in those cramped, hard-to-get-at-places. Its five cubic foot capacity permits

EARL H. PENCE & CO., INC.

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Q AND C CAR STOPS CONSERVE TRACK SPACE



Q and C Car Stops are made in one size, suitable for use on all rails found in yards and side tracks. Their use results in real economy because they are applied with a minimum of labor and require very little track space.



They wedge firmly to the rails. No drilling is necessary.

Specify them on your requisitions.

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TTA AUGUST 1053 F.	or additional information, use postcard, pages 759-	760 PAILWAY TRACK and STRUCTURES

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Vhold more Hake less space

One Kraftbilt Vertical Rollfile holds 96 rolled maps. One unit of a Kraftbilt Horizontal Rollfile holds 112 rolled maps! Made specially for all types of rolled charts and plans, tracings, blue prints, maps, drawings. Of all-steel, fire-resistant construction. Disappearing doors and drawers mounted on ball-bearings. Kraftbilt cabinets lock out dust, moisture, insects. Send for Bulletin 352-B for details.



Kraftbilt all-plastic snapon Map Sticks take the work out of map handling. They are quicker, lighter, stronger. And Kraftbilt Map Weights act as extra hands in eliminating the use of thumb tacks. Just toes 'em on!

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RAILWAY TRACK and STRUCTURES

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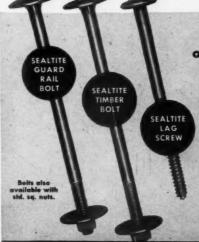
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Ross-Martin Company

Sealtite railroad fasteners



Used by 85% of America's Class 1 Railroads

SPECIFY SEALED-TITE ZINC COATING-Seallife products scaled in zinc give twice the west and greater economy by cutting expensive replacements. For Double-Life and fraudom fram cerrosion, specify Het-Dip Galvanized . . . Sealed in Zinci

See your Lowis raprocentative, or contact factory for samples, prices and full details.

Lewis BOLT & NUT COMPANY

Speno, Frank, Railroad Ballast Cleaning Co.,

AUGUST, 1953

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For additional information, use postcard, pages 759-760



Rugged, temperature-proof Caterpillar D6 Tractors stopped disaster in its tracks in Monarch, Colo.

Ten feet of snow fell in January, smothering tracks of the Denver & Rio Grande Western Railroad. The railroad hauls limestone flux from pit to blast furnaces. Stoppage of the rock would have shut down the huge mills. The temperature dived to 40 below zero. But in one day trains were running.

Reports Harry Bender, Salida, Colo., owner of the D6 pictured working above:

"During the emergency we worked night and day in severe storms. We started our Cat* machines many mornings at 40 below zero without trouble. We kept the trains running."

A gratifying performance, but not unusual. Caterpillar equipment is engineered to whip nature's extremes.

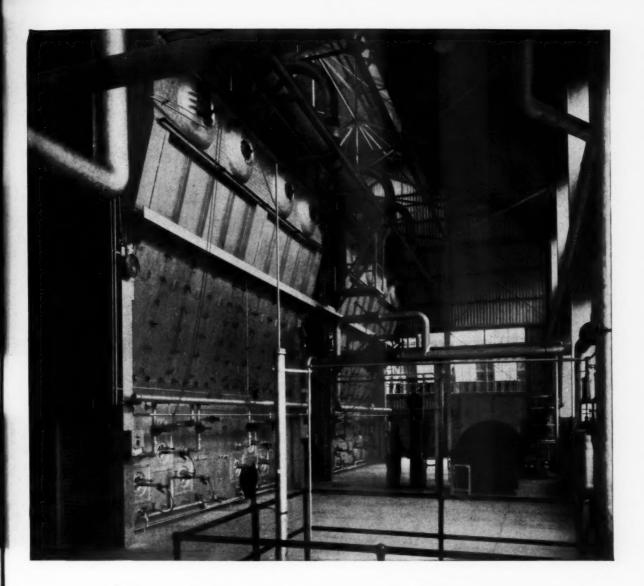
It was designed to start—and to work—at 40 below zero. We call it "positive starting." That means an independent gasoline engine starts the Diesel. It spins and conditions the engine before any load is placed on it. It circulates lubricating oil, warms the water, intake air, liners and other parts of the Diesel. It has power to spin the Diesel at full compression for as long as it is necessary. That—and only that—is "positive starting."

Caterpillar offers a full line of year-round, all-purpose off-track equipment that is ready to work when you need it the most. Your Caterpillar Dealer knows railroad problems. He'll be happy to demonstrate the equipment that will cut your costs while it increases your service.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR* *Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE



How to brighten dark rooms with just one coat of paint

When you consider labor costs on a job like this, you soon realize that it's only good business to use the best quality paint. Particularly when an aluminum paint formulated to your specific needs may well save you the cost of a second coat.

While Alcoa does not make paint, it's our business to know all about the aluminum pigments that go into the best brands. We supply most of them. Working together, Alcoa technicians and leading paint manufacturers have found ways to combine pigments and vehicles for the utmost protection against the most common industrial paint problems—heat, cold, dirt, moisture, smoke, fumes and corrosive action.

If there's a spot that needs brightening in your plant—or a smokestack, tank, boiler or other equipment that deserves preserving—find out how far a brushful of the *right* aluminum paint will go, *how long it will last*.

Ask your paint supplier about specially formulated aluminum paints made with Alcoa®Albron Pigments, Or tell us

your problems. We'll gladly recommend the correct type of aluminum paint for your job.

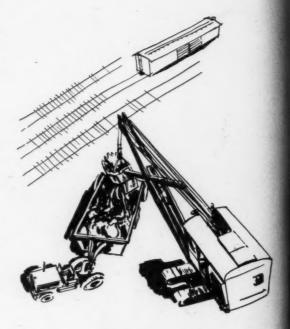
For a free copy of our 32-page booklet, *Painting with Aluminum*, just call your local Alcoa sales office or write: Paint Service Bureau, Aluminum Company of America, 1789-H Alcoa Building, Pittsburgh 19, Pennsylvania.

ALUMINUM COMPANY OF AMERICA

We've claimed Cat* Engines and Electric Sets are rated for honest HP and KW-that they give you faster work cycles—handle bigger loads—start fast in any weather—use low-cost No. 2 furnace oil without fouling.

We've claimed that your Caterpillar Dealer backs them up with prompt, onthe-spot service.

We've claimed they will last longer and do more work with less down time than any other unit.



NOW MAKE US PROVEIT!

Your Caterpillar Dealer is ready to give you facts and figures—show you engines and electric sets at work on off-track and on-track jobs—provide a list of owners you can talk to. He's as near as your phone. Call him today!

CATERPILLAR, Peoria, Illinois.

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